





# THE CHILDREN'S ENCYCLOPÆDIA

EDITED BY  
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VOLUME SIX

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**BLOSSOMS**

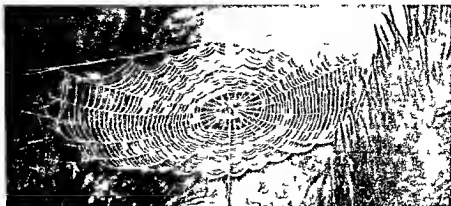


**SEA SHELLS**

These two beautiful pictures were painted by Albert Moore the British artist whose decorative pictures are famous. "Blossoms" is in the National Gallery of British Art and "Sea Shells" is reproduced here from a photograph by Cassell Smith.



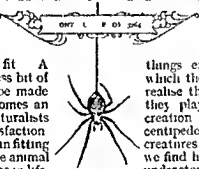
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## THINGS THAT CREEP & CRAWL

It is quite a good game to take a big bunch of keys and find the locks which all the keys fit. A key of itself is a useless bit of steel but if it can be made to turn a lock it becomes an article of value. Naturalists find the same satisfaction only on a larger scale in fitting the little things of the animal world to their purposes in life. The keys were made to fit locks and we taking them as they come have to find their places. Nature has a purpose for all her creatures and it is for us to discover what that purpose is.

Some of Nature's creatures seem to have departed from the work for which we imagine them to have been created. We cannot think that flies and mosquitoes were made to inflict death upon men and beasts. They have departed from their original purpose we think just as men who thieve and kill other men have departed from their original purpose. On the other hand we think that many things in the animal world are horrid if not harmful when really they are quite good friends to man. Most of us dislike creepy, wriggly things. Centipedes and spiders are among the things which fill most people with



horror. Well we must do with them as we have done with so many other

things. examine the purpose which they serve in life and realise the value of the part they play in the scheme of creation. First let us look at the centipedes—those long bodied creatures with many legs which we find hiding in dark places under stones behind the bark of

trees and so on. When a centipede is discovered a child generally feels as if it must crush the miserable thing.

To do so is foolish for the centipede of this country does only good. It devours worms and insects and is a check upon the too rapid increase of these. Many of the centipedes are blind. Those that have eyes can distinguish light from darkness but little more. The antennae supply the place of eyes. With these they feel their way along the ground and discover things good for food. All the centipedes are of use hence the value in the garden of those that live in the country.

British centipedes are small compared with those that flourish in tropical land. But we notice a peculiarity about ours which distinguishes foreign centipedes as well they all have many pairs of legs.

but the number of pairs is always odd. Centipedes never have a dozen pairs or a score of pairs, or even a hundred pairs; they never have anything but odd numbers of pairs, whether it be fifteen or 121 pairs. Many people cannot tell the difference between a centipede and a millipede. There is a distinct difference. The centipede has one pair of legs to each segment of its body, the millipede has two pairs of legs to most of the segments of its body.

#### CENTIPEDES THAT EAT FLESH AND MILLIPEDES THAT EAT HERBS

The centipede is, as we have noted, always a flesh-eater; the millipede lives only on vegetable food. A further distinction between the two may be noted in the shape, for whereas the body of the centipede is flattened, that of the millipede is shaped like a cylinder.

There are only two classes of centipedes, but the families included are numerous and they vary a good deal. The most famous are those which live in the hot countries of South America. These may well terrify people, for they grow to a length of twelve inches, and their bite is poisonous—not poisonous enough to kill a man, but bad enough to cause him pain. They live in hiding all through the day, but where human beings are, these great creatures creep into bedding, boots, gloves, and other clothing. A man goes to put on his boot, and finds a huge and savage centipede inside which promptly bites him, and causes a bad swelling on his foot. Of course, creatures like these are much hated by men, but they do good work when left alone devouring multitudes of cockroaches, beetles, and other unpleasant and injurious things.

#### A GIANT CENTIPEDE IN LONDON THAT FED UPON MICE

It is hard to say what they will not eat. They have been known to devour lizards bigger than themselves, and one which lived at our Zoo fed upon mice. Other centipedes may be found hiding near the seashore, while others live down in the soil like the worms upon which they live. To the earth-worms these centipedes must seem like terrible boa-constrictors, for the centipedes twine themselves round their victims while they eat them. The millipedes lack the poison duct which the centipedes have, and they possess only two pairs of

jaws—half the number owned by the centipede. There are many sorts and sizes of them, but they are all harmless, unless they neglect their task of eating waste vegetation, and take to destroying useful plants. Two curious forms are the slug millipede, a creature with an enormous number of legs, which can roll itself up, and the pill millipede, which curls itself up like a tiny hedgehog. For that reason it is sometimes confounded with a totally different little animal, the wood-louse. This belongs to the same family in Nature as the crab and the shrimp, being a crustacean, though it lives on land.

There are about 250 species of woodlice, but the one which we may notice here is that one which, as soon as it is touched, converts itself into a little ball. We need not stay to discuss it here, but must just note in passing that the life-story of this humble little animal is one which causes wonder to learned men. Its habits are the source of much trouble to gardeners, especially nursery gardeners, who have to grow things in hothouses for market.

#### THE SERIOUS DAMAGE THAT THE WOOD-LOUSE DOES IN OUR GARDENS

The wood-louse is one of the worst foes of the man who grows costly maidenhair fern. The creature loves the tender shoots of the fern, and, taking itself and its family of little ones to the root of a plant, there it settles and secretly gnaws away at the stalks, sucking out the vital juice of the plant.

The damage that these crustaceans do in this way almost passes belief. They cannot always be killed by putting down stuff to destroy insects, for that would be too costly, and the same things which kill the woodlice may at the same time kill the plants. The only thing to do seems to be to take each pot separately and shake out the woodlice which it contains, and kill them. Think what a task this means when a nurseryman has thousands and thousands of pots. Before the pots can be cleared of their enemies, the latter may have done such harm as cannot be remedied. When the pots have been cleared of woodlice, the nurserymen have to plan to keep them free. They tried to do this by raising on tins the wooden staging on which the pots stand. But, as soon as

# CENTIPEDES, MILLIPEDES, AND MITES



The centipede whose name means a hundred feet and the millipede meaning a thousand feet do not have a hundred and a thousand feet the names are exaggerations. But a may be a from the aspect they have many feet. On the left is the common centipede of our gardens and on the right the millipede. The middle picture shows one of the giant centipedes of the tropics which grow sometimes a foot length and their bites as dangerous as the bite of a snake. These giant centipedes have been known to eat a dead animal.



There is a long worm-like centipede called the geophilus a word that means earth-lover because it is entirely underground. It burrows like the earth-worm and its food consists almost entirely of worms. Here we see the geophilus grappling with a fat earthworm which it has seized of which it will eat last on.



We should not suppose that the woodlice and those funny little creatures in our garden that crawl up into a hall when disturbed, belong to the same order as the crabs and lobsters. Yet this is so. The woodlice are crustaceans but they are a tall roll up and as we see on the left the giant wood-louse and on the right the common wood louse, with which of which rolls up. On the right is the pill millipede that is often mistaken for the pill wood-louse of our gardens. The creature gets its name from the fact that when rolled up they look like a pill.



The mites and ticks which belong to the spider family are very small and these pictures of some of them are greatly magnified. They either suck our fruits and flowers like the currant-bud mite of the left-hand picture and the bulb mites on the right or they prey upon other creatures like the elephant-tick of the middle picture. Some insects, birds, and large animals, all have their parasites in the form of mites and ticks that live upon them.

the tins got rusty, the wood-lice crawled up and reached the pots. Then they did away with the tins and used glass jars as supports. But the wood-lice were not to be beaten even by this trick. They crawled up the wooden rafters of the glasshouses, and then, curling up, let themselves drop into the pots below.

#### **A NEMY OF THE GARDEN AND GREEN-HOUSE THAT MAY BECOME A FRIEND**

At a single nursery where there are only fourteen greenhouses the wood-lice do damage amounting to £50 a year. Think, then, what damage they do altogether in the hundreds of nurseries of a bigger size, where ferns and other things that they like are grown. If denied ferns and other luxuries, the wood-lice can live extremely well on waste vegetation, and, by eating that, it is a benefactor to man.

We will leave them to their wickedness, and pass on to those interesting "insects," the spiders. As a matter of fact, they are not insects at all. Insects have only three pairs of legs, but spiders have four pairs. They, with the millipedes and centipedes, the scorpions and mites, belong to a division of the animal world not included in the insect family. But, by whatever scientific name they may be called, every child knows a spider when he sees one.

Not every child, however, understands how marvellous is the skill, how extraordinary the character of the work done by the spider. It is the finest spinner in the world. It does not provide silk as good as that which comes from the silkworm, but it provides silk enough to make the most wonderful floating buildings in the world. The fineness and strength of a spider's web can never be matched by man.

#### **THE SPIDER'S WONDERFUL WEB THAT IS STRONGER THAN A FRAME OF STEEL**

What is the web, and how does the spider produce it? The web, before it leaves the spider, is a kind of gum. When it issues from the body of the spider, it takes the form of the finest silk, almost too thin to imagine, but stronger, in proportion to its thickness, than steel bars. The spider is generally provided with six tubes—sometimes there may be only four—placed in the lower part of its body. Each of these tubes is more than a tube—each is really the finest of fine sieves. The silk does not

come out in one strand from the tube. There are a thousand holes to this sieve that the tube encloses. From each hole the silk comes forth as a separate thread. The thousand threads issuing from each tube combine to form one thread. But there are six tubes we remember. Then the six threads, each formed of a thousand or more threads, combine again to make the one thread of which the spider builds its web.

Every bit of web that we see may contain from 4,000 to 6,000 strands of silk, all woven together to make the finest natural rope in the world. A careful man has calculated that the threads of silk, as they issue from the thousands of holes in the sieves, are so fine that it would require four million of them to form a silk thread as thick as the hair of a man's beard. So small are the holes in the sieve through which the silk is drawn by the spider that a thousand of them are crowded together in the space covered by the point of a pin.

#### **THE TERRIBLE FEMALE SPIDER THAT EATS HER HUSBAND**

We may see the wonders of spider life for ourselves, for every garden has its spiders, and there is no web-spinning spider more interesting than the big fat queen of the cobwebs who dwells on bush and shrub in the garden. It depends on the weather how she will begin. We say "she" because the female spiders are the more important. The males are small, and are more often than not eaten up by the females after the wedding-day. In fact, they may be gobbled up even before the courtship is over. The lady spider is the most terrible sweetheart in the world. We will leave out of account all male spiders, therefore, and watch a female. It depends, we agree, upon the weather how she will begin to build.

She starts by drawing forth a little quantity of silk. This she does by rapidly moving certain very sensitive wavy hairs upon her legs. She fastens the end to the place on which she is standing. Then she may have to run away to another point, to fix the other end of the web there, letting the silk trail out as she runs. But if there is a wind blowing she does as the smaller spiders do—lets her silk float free for the wind to carry it, and cause it to stick to some point where it can be made

# LAND SPIDERS AND WATER SPIDERS



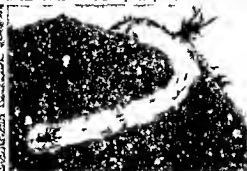
This is the female of the common garden spider. She is much larger than the male which is shown on the next page.



The common house spider does not build a beautiful geometrical web like the garden spider, but makes a flat, irregular web like the one shown here. The web is only a few inches in diameter and is usually found in our houses where the spider spins its web.



The little harvestman spider is so small that it is often mistaken for a tick. It is a harmless spider and is found in the same places as the common house spider.



The spider on the left is the common house spider, and the one on the right is the little harvestman. The middle picture shows a spider on a leaf, which is a common house spider. The spider on the left is the common house spider, and the one on the right is the little harvestman. The middle picture shows a spider on a leaf, which is a common house spider.



Here we see the entrance to the spider's home. The spider is on the left, and the entrance is on the right.



The water spider (Arachne aquatica) is a very interesting creature. It lives in the water and can breathe through its gills. It is a very small spider and is found in the same places as the common house spider. The water spider is a very interesting creature. It lives in the water and can breathe through its gills. It is a very small spider and is found in the same places as the common house spider.



fast. The web is sticky, and clings to whatever it touches. Now she has got her tight-rope, and runs rapidly over it, and makes supports in all directions, lines which cross from side to side, fixed at both ends, but all passing through the exact centre of the web. Next she begins at the middle, and works out a spiral pattern of four or five rings, which fill out the centre of the web, and make it strong for her other work. The real business has yet to come. She now goes to the outer portion of the web, and, spinning all the time, works round and round, leaving a line of silk all the way, gradually drawing nearer and nearer the centre. This is the part which has to catch the flies. The part first done in the centre does not matter now. The spider may even take it to pieces and eat the silk for it to be formed again in her body into fresh material for silk.

When the web is finished, the spider may need her own nest. She may decide not to remain in sight upon the web, lest insects seeing her should flee.

#### THE FIERCE POUNCE OF THE SPIDER THAT MEANS DEATH TO THE FLY

Generally speaking, the garden spider does run the risk, but others do not. These others make a little nest of silk hidden away — a hiding-place nest which generally has two openings, top and bottom. Threads lead from the web to this nest, and the moment any insect touches the web these threads vibrate and warn the spider that a stranger has entered. She does not ask him to walk into her parlour. She springs out of hiding, rushes along the web with her clawed feet, pounces upon the insect, poisons it with one swift thrust of her weapon, then feasts upon its blood.

But suppose there should be more than one fly in the web at a time? The spider does not waste food. This is what a very big one in a garden did when a bluebottle-fly entered her nest while she was feeding upon another fly. With a buzz and a kicking and fluttering the bluebottle announced his arrival. He could not escape, for the net was too sticky. But there was just a chance that he would do some damage. The spider ran no risks. She uncoiled her legs from the fly upon which she was dining, and rushed like a flash across the web to the bluebottle.

She grappled with him, and, with one movement, made it impossible for him to get away. She did not kill him, but seemed to stupefy him. For a few seconds she was busy with her claws round him, then suddenly the big bluebottle began to spin round and round on a thread of silk, her claws making him spin. And, lo, in a twinkling, he was completely wrapped in a sheet of silk.

#### THE MYRIADS OF PESTS THAT THE SPIDERS DETEST

She had spun a cocoon all over him, and she now hung him up in this cocoon in the web and went calmly back to her first meal, leaving him until she was ready to eat him at her leisure. It is of no use pretending that we love spiders, because we do not. We all shudder at their work, but at the same time we know that they are among the greatest friends we have in destroying, every summer, myriads of flies and harmful insects which, if left to multiply, might make our lives almost unbearable.

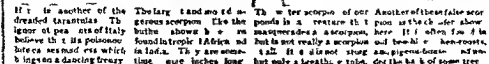
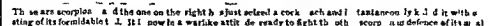
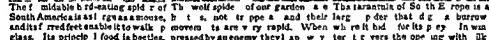
Leaving out of account the seeming cruelty of the spider's life, which, after all, is no worse than that of the beautiful birds which live, as she lives, upon insects, we can all admire the wonder of her building. That nest of hers is so strong that the wind will not blow it down, and heavy dew will glisten in its meshes without breaking a thread. The strength of each strand of silk in the web is wonderful, but the strength of the whole, thanks to the beautiful way in which it is made, can scarcely be believed. A scientist has tried to make it plain in this way.

Let us suppose, he says, that a child can lift a six-pound weight one foot high with 350 rubber bands, each band capable, when stretched, of pulling six pounds a distance of one foot. Let these bands be fastened to a wooden platform, on which stand two horses, weighing 2,100 pounds, or nearly a ton.

#### THE MARVELLOUS STRENGTH OF THE SPIDER'S TINY SILK THREADS

If, now, the child will set to work and stretch these rubber bands one by one, hooking each one up as it is stretched, in less than twenty minutes that child will have raised the pair of horses a distance of one foot. The elasticity of the rubber bands enables the child to divide the weight of the horses into 350 parts of six pounds each, and,

## SPIDERS AND SCORPIONS WITH THEIR PREY



by lifting all these separate pieces one foot at a time, the child can in the end easily raise this great weight. Each thread of the spider's web acts exactly like one of the rubber bands.

The garden spider makes her web in order that she may remain in comfort at home, but she has tiny relatives who use their silk for travelling. They send out their threads of silk as the garden spider sends out hers, but instead of waiting for the web to catch hold of some support, they float away on the little magic carpet of their own making. The wind catches up the light strands of silk, and away they go up into the air with the spider comfortably swinging at the end. In this way the spiders often travel great distances, for they have been met far out at sea. Many of the webs, becoming drenched with moisture, descend upon trees and hedges, some are blown across paths, and, wet and heavy, catch our faces as we walk. On bright autumn mornings, as we motor along the country roads, the face of the driver and the front of the car catch scores of these webs. It is to be feared that the people in the car think only what a nuisance these little webs are, and never pause to reflect upon the wonder of them.

#### A SPIDER THAT DIGS A HOLE AND COVERS IT WITH A LID

The feats of our garden spider, wonderful as they are, seem commonplace when contrasted with the work of the trap-door spider. This creature is more common in hot countries than in Europe, but it exists in England, though it is not represented here by the largest species. By some naturalists it is called the mason spider, but its more common name is that which we give it here.

It makes a circular shaft in the earth about a foot deep, and from half an inch to one and a half inches wide. This shaft it first coats with a glazing material which makes it water-tight, and prevents particles of earth from falling in. Next, it lines the whole shaft with a covering of silk-like paper. Some of the tunnels have two tubes. The first tube descends in a straight line, and the second tube is made to branch off at a tangent, and to ascend, so that the two tubes are forked like a catapult. The door at the entrance to the shaft is, however, the greatest masterpiece

of this spider's work. It is formed of layers of silk and earth, and exactly resembles its surroundings. The spider is so skilful in practising this deceit that it even glues pieces of earth and bits of dead leaves to the upper side of the door, so that it is quite impossible when the door is closed to discover it.

#### THE WONDERFUL DOOR OF THE SPIDER'S UNDERGROUND HOME

The hinge of the door is composed of strong silk, so that the trap can be pushed open quite easily from below. Should an enemy by some means find the trap-door, as it may by pursuing the spider to its home, the occupant, darting into the hole, pulls the door to with its claws and holds it tightly in position. It must be not uncommon for this to happen in some parts of the world, for there are spiders that are not content with one door, they have one door at the top of their shaft, and another, a smaller one, some few inches lower down.

The trap-door spider lives at the bottom of the tube. It must have very acute hearing, for it can detect the footfall of the lightest insect. Fancy our hearing an ant walking along the ground! The spider does, and out of its cell it dashes, seizes the insect, and drags it down into the shaft, where it sucks the juices which its body contains, then brings up the carcase and throws it well away from its home. Should any damage be done to its dwelling, the spider at once repairs it. By watching the spiders come out at night, naturalists have been able to discover these homes, and, to test the power of the spider, have removed the trap-door. It is proved that the spider can repair the damage five times, but no more. After the fifth destruction of its door, the spider gives up the struggle and goes away and hides, doubtless to await the time when it shall have accumulated a store of silk with which to renew work.

#### GREAT SPIDERS THAT CATCH BIRDS AND MICE IN THEIR WEBS

The strength of the webs woven by some of the tropical spiders far exceeds that of the webs which we know in this country. In the web of one, a mouse was caught. The spider increased its web, and actually succeeded, by adding new strands of considerable length, in raising the mouse four inches—in the

same way we may take it that the child would raise the horses by means of elastic bands. We need not be surprised therefore that the webs of spiders like these are strong enough to catch birds. We must not however regard these as the real bird catching spiders. That spider does not set snares to catch its prey. It makes a web it is true but this is in clefts of trees or between rocks and here it hides all the day.

**SPIDERS AS BIG AS RATS THAT CHILDREN LEAD ABOUT AS PETS**

At night it comes forth a fearful looking monster nearly as big as a rat. When its legs are outspread it occupies a surface nearly a foot in diameter. It can climb anywhere for its feet are so padded with silk that it can easily run up a sheet of smooth glass set in an upright position. Its food consists for the most part of beetles and other insects but it will eat any living thing which it can overpower. Thus it happens that when it finds a bird the spider pounces on it pins it down and sucks its blood. This is the biggest of the spiders, and one of the most famous.

The strange thing is that children keep these spiders as pets. They tie a thread round what we may call the waist of the spider so that it cannot get away and lead it about as we in this country lead little dogs.

A very famous and dreadful spider is the tarantula which was for a long time supposed to cause people the most extraordinary illness called tarantism. Old time doctors made a careful study of the matter and decided that nothing but music could cure the sufferers and books still exist advocating this mode of treatment and actually giving the names of the pieces of music to be played for the relief of the victim. The tarantula really does give a bad bite but the idea of its causing dancing madness, as the supposed ailment was called is all nonsense.

**THE WOLF SPIDER THAT WILL LAY DOWN HER LIFE FOR HER CHILDREN**

The tarantula is only a big wolf spider and wolf spiders of various sorts and sizes are common in parts of Europe. We have the smaller sorts in England. They are the pacers which we see racing about in the summer among stones and grass. They do not spin webs to catch their prey but

depend upon the speed with which they can run. The mother wolf spider may often be seen carrying with her the little packet in which her eggs are deposited. She is a brave and good mother and will fight to the death to protect her little ones and her eggs. When the little spiders are born she carries them about on her back the babies fastening themselves on with strands of silk until they are big enough to run about and look after themselves.

The wolf spider can get over the ground at a great rate but not so rapidly as the bunting spiders which we may find in our gardens on a hot day. For the hunters not only run but make great leaps and so catch the fly or other insect that they desire to have. It is quite exciting to see them spring down a high wall for it would seem as though having no wings they must fall head long to the bottom. But they know better than that they attach themselves to the starting point by a silken rope which runs out as long as they wish to descend but stops when they reach the object for which they aimed. Then they can climb back by the aid of the rope bearing their prey with them.

**THE MARVELLOUS BALLOON OF A SPIDER AT THE BOTTOM OF A POND**

One of the most interesting spiders may be seen in any quiet pond or ditch. The water spider is indeed one of the marvels of the animal world. It is a creature which must breathe the air of the atmosphere to live yet it is born under water and passes all its day in or upon the water. It can run as easily and lightly upon the water as an ordinary creature can run on the land. Suddenly it dives into the water and we see it darting down glistening with bubbles. And those bubbles explain the whole mystery. The water spider is thickly covered with hairs and little bristles and when it dives into the water these carry air down with them so that the skin of the spider is never wet.

But the most important thing is a big bubble of air which the female spider somehow manages to carry down secured between her hind legs. When she first goes down into the water she spins under the water a little dome shaped cell of silk with it as a roof and downward. Having made this she ascends to the top of the water

charges her whole body with air, and so arranges her hind legs that the big bubble of air cannot escape. Thus air she discharges into the nest which she has previously made. She makes several journeys up to the top of the pond, and each time descends and acts as before, until the air fills the cell and forces out the water. Thus she has a little palace of silk and air in the water secure from all her enemies. Here she makes her home and lays her eggs.

#### A SPIDER THAT BUILDS A RAFT AND PUTS HER EGGS IN A BAG

Another happy spider is the raft-spider. This one makes the neatest little raft of leaves, and on it floats about on the surface of the lake where she makes her home. If she sees a fly afar off, she darts from her raft and runs, light as air, upon the water. Should there be food down below, she trips nimbly down the stem of a plant growing in the water, and so reaches her meal. When she has laid her eggs she makes them up in a neat little silken bundle and carries this about with her. When the time draws near for the eggs to hatch, however, she fastens the cocoon to some plant growing near the edge of the water.

There are many more spiders in the world which afford interesting study. Some are fearful things, which can change the colour of their eyes at will, as the chameleon can change the colour of its skin. Some run sideways like a crab, some build nests on coral, which keep out the water when the tide rises, and these spiders live on fish. There are spiders pretty well everywhere. Their very existence is a sure evidence of a great number of insects, and that is a good answer to the question as to what purpose they serve in life.

#### THE MITES THAT ARE FOUND ON ANIMALS AND MITES THAT WE FIND IN CHEESE

In the same class as the spiders are the mites and ticks, tiny things that live, for the most part, as parasites upon other little animals. Some infest birds, some make the lives of sheep miserable, some are small enough to live upon the bodies of beetles and harvest-spiders. We need note only one, however, and that is the cheese-mite, which, as it is common in our food, is specially interesting to us. How do mites get into fine old Stilton Gorgonzola, or other

cheese? We know that the cheese in the making has undergone such a process that no living thing should be in it. Further, we know that life does not begin of itself anywhere. How, then, come the mites in our cheese at table? The explanation may surprise some people who think that a cheese is not prime and rich unless it has mites.

The mites are hatched from eggs laid by a nasty little fly which is related to the house-fly. The fly gets into the larder, or into the cheese-store, and selects a cheese which is cracked or broken upon the outside. In this crack it lays its eggs. These, when hatched, produce tiny maggots which we call mites, or hoppers, which in course of time will, if not destroyed, turn into flies. Hence the presence of mites in cheese is no testimony to the good quality of the cheese, but rather indicates that the cheese has not been as carefully treated as should have been the case—not kept as clean and safe from insects as clean people should have their food.

#### THE SAVAGE SCORPION'S STING THAT WILL MAKE A MAN ILL

In concluding, we turn from the smallest to the largest of the class to which this story is devoted, and we come at last to the scorpion. It is a hungry, savage creature, and serves a purpose by consuming an enormous number of harmful insects. The rest of its character is bad. Seemingly, the scorpion was a poisonous, bad-tempered creature when it was created, and its manners, like its form, have remained unchanged. The worst scorpions live in the hottest parts of Africa and in India. These reach a length of eight or nine inches, and their sting is so bad as to make even strong men very ill indeed. The scorpion's body is half tail. That tail, as it swiftly moves along, it carries in the air, raised over its back. When it grasps anything, down comes the tail, and from the end a sting protrudes, and a horrid poison is squirted into the wound which the sting causes. The poison serves to paralyse the insect seized by the enemy.

Scorpions may be very well as a check upon insects, but they get into beds and boots and other places where they should not be, and when the owner arrives they sting him without mercy.

The next stories of Nature are on page 3407



## HANSEL AND GRETHEL

Over upon a time  
near the borders  
of a dense forest there  
dwelt a poor man who  
earned his living by cutting wood

On his way home through the  
wood one day he found a poor  
little girl who had been carried away  
by a vulture and left high up on the  
branch of a tree to die. He took the  
little girl home to his wife and they  
called her Grethel and brought her  
up with their only son Hansel. But  
his wife died and the wood cutter  
married again. After a little while the  
wood cutter became very poor indeed  
and could hardly earn enough money  
to buy bread.

One night as they were lying awake  
weak and restless from hunger  
Hansel and Grethel heard their step-  
mother say to their father

In a few days we shall all die of  
hunger. If we had only ourselves to  
keep we might manage to live. I  
know what we must do. Early to-  
morrow morning we will take the  
children far into the forest and leave  
them there.

No wife said the man. How  
can I have the heart to leave my  
children all alone in the forest for the  
wild beasts to kill and devour?

But the hard hearted woman talked  
and talked until the poor man agreed.

Hearing this dreadful plan Grethel  
wept bitterly. But Hansel who  
deeply loved her comforted her

Do not cry dear  
Grethel said he. I  
will find a way to  
get home safely.

He then got up quietly crept  
out of the house and filled his  
pockets with little white pebbles.

At sunrise their stepmother  
wakened Hansel and Grethel, saying  
Get up children for we are going  
into the forest to gather wood and  
she gave them two slices of bread for  
their dinner. Grethel carried both  
pieces in her apron as Hansel's  
pockets were full of pebbles.

As they went along Hansel kept  
looking back until at last his step-  
mother asked him sharply why he  
kept lingering and looking behind.

I can see my little white cat  
sitting on the roof and I am sure she  
is crying for me said Hansel.

You stupid! he replied. It  
is only the sun shining on the  
chimney pot.

When they reached the middle of  
the wood their stepmother said

Run about and collect some  
twigs and we will make a bonfire to  
keep us warm.

And Hansel and Grethel soon had a  
blazing bonfire of birch wood. Tired  
with their long walk they fell asleep  
but when they woke up it was dark  
and they were quite alone. Grethel  
began to cry bitterly but Hansel said

We shall be able to find our way  
home all right when the moon rises.

because I dropped a white pebble every time I looked behind this morning."

When they reached home they were scolded by their stepmother for straying away, but then father was ever so pleased to see them come back safely.

Not long afterwards, however, the same poverty came upon them, and the stepmother persuaded her husband to take the children much farther into the wood. The children again overheard the cruel scheme, but Hansel was unable to get a pocketful of stones because his mother had locked the door. He bravely lingered behind, however, and dropped crumbs from his piece of bread all the way along.

"Why do you lag behind so, Hansel?" said the woman.

"I am looking at my little dove sitting on the roof wanting to say good-bye to me," replied Hansel.

"You silly boy!" said she. "It is only the morning sun shining on the housetop."

Then mother left them asleep just as before, and when Gretel said, "What are we to do, Hansel, dear, for the night is coming on and we are much farther in the forest than we were last?" Hansel replied, "Do not fear, dear Gretel, I have left all my bread in little crumbs on the wayside."

Gretel then dried her eyes and shared her piece of bread with Hansel. When the moon rose they started off, but, to their alarm they found that there were no crumbs to be seen, as the birds had eaten them all up. They wandered about the forest all through the night and the next day, having only berries to eat, but they could not find their way home, so they laid themselves down and went to sleep.

About noon the next day they saw a lovely snow-white bird sitting on a branch, and singing so beautifully that they listened to it for a long while. When it had finished singing it flew slowly away, looking round at them as if inviting the children to follow. Thus Hansel and Gretel did, and after a little while the bird perched on the roof of a tiny house.

To their surprise they found that the walls of this little house were made of gingerbread, the roof of cake, and the windows of barley sugar.

"Oh! Something to eat at last!" cried the hungry Hansel. "Here is a lovely piece of barley sugar for you, Gretel." And the two children pulled pieces of gingerbread off the walls, and ate to their heart's content. Suddenly a voice came from within.

"Munching, crunching, munching, Who is eating up my house?"

And the children answered:

"The wind, the wind,  
'Tis only the wind!"

and went on eating hungrily.

In a minute or two the door opened, and a little old woman hobbled out.

"Poor little children," said she. "How tired and hungry you look! Come in with me, and I will give you plenty to eat and drink."

The children followed her in, and had a meal of milk and pancakes, and apples and nuts. And then she put them into two pretty little beds, and they fell asleep and dreamt they were in heaven.

Now, the old woman was really a witch, who built this gingerbread house to attract children, so that she could capture them and eat them. So when Hansel was asleep she took hold of him and quickly shut him up in an iron cage. She then shook Gretel, and said:

"Get up, lazy bones, and help me get water and cook some food, for I am going to fatten your brother and eat him!"

After breakfast the old woman went out. Gretel immediately ran and told Hansel all the old woman had said.

"The old woman must be a bad fairy," said Hansel. "Search for her magic wand and pipe, and then help me out of this cage!"

So Gretel found the wand and pipe, and they ran away together. After some time the old fairy came back, and was very angry to find that Hansel and Gretel had escaped her. So she put on her seven-leagued boots, and quickly caught up the children.

As soon as she saw the bad fairy, however, Gretel waved the magic wand, changed herself into a lake, and Hansel into a swan floating on it.

The fairy tried hard to entice the swan to the shore by offering him crumbs of bread and cake, but he would not move, so she gave it up and went home in disgust for the night. Gretel then changed Hansel and herself back into their proper forms, and

# THE WITCH OF THE GINGERBREAD HOUSE



When Hans and Gretel were in the forest they came upon a wonderful house made of gingerbread, with a roof of cake and windows of barley sugar. They were so hungry that they immediately broke off a big piece of sugar and began to eat it. So doing to their amazement, an old witch appeared.



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Gretel then shut her eyes and shared her piece of bread with Hansel. When the moon rose they started off, but, to their alarm, they found that there were no crumbs to be seen, as the birds had eaten them all up. They wandered about the forest all through the night and the next day, having only berries to eat, but they could not find their way home, so they laid themselves down and went to sleep.

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on they went. Next day they perceived the fairy overtaking them again. This time Grethel changed herself into a rose in a prickly hedge, and Hansel sat on a mossy bank beside it and waited.

The fairy soon came up and mounted the bank to pick the rose which she knew must be Grethel. Hansel quickly put the pipe to his mouth and began to play. Now, as it was a fairy pipe, everyone who heard its music had to dance, even the old fairy, and there she capered and jugged, getting fixed firmly into the hedge, where the sharp thorns tore her clothes off and pricked her skin.

Grethel hid herself once more and they went on again, but became very weary, so Grethel decided to turn herself into a daisy while Hansel tried to find the way home alone. But Hansel got lost and did not return.

One day a shepherd spied the daisy, and picked it, saying, "I will take this little flower home with me, it is the prettiest daisy I have ever seen."

So he took it home and placed it in a box, and from that day everything flourished wonderfully in his house. All the work was done, the fire made and the water fetched, before he got up. He could not make this out, so he went to a wise woman, and she said,

"It must be witchcraft. Get up early to-morrow morning and throw a white cloth over anything that moves."

So he got up early and saw the box open and the daisy come out. He at once threw a white cloth over it, and the beautiful Grethel stood before him. She told him her troubles, and said,

"I will stay with you until Hansel comes back."

A long while passed and Hansel came back. Hansel and Grethel once more started for home, but getting tired they went to sleep in an old hollow tree.

In the morning when they awoke, the sun had risen high above the trees, and it was very hot. Little Hansel said,

"Sister, I am very thirsty, if I could find a brook I would go and drink, and fetch you some water too. Listen! I think I hear the sound of one."

Then Hansel rose up and took Grethel by the hand and went in search of the brook. But the fairy had found out all that had happened, and intended to do them harm, and when they had found a brook that ran sparkling over the

pebbles, Hansel wanted to drink, but Grethel thought she heard the brook, as it babbled along, say, "Whoever drinks here will be turned into a tiger." Then she cried out.

"Ah, brother, do not drink, or you will be turned into a wild beast and tear me to pieces!"

"I will wait," said Hansel, "for the next brook."

But when they came to the next, Grethel listened again, and thought she heard "Whoever drinks here will become a wolf." Then she cried,

"Brother, brother, do not drink, or you will become a wolf and eat me!"

So he did not drink, but said,

"I will wait for the next brook, there I must drink, say what you will, for I am so thirsty."

As they came to the third brook, Grethel listened, and heard "Whoever drinks here will become a fawn."

"Ah, brother," said she, "do not drink, or you will be turned into a fawn and run away from me!"

But Hansel had already stooped down upon his knees, and the moment he put his lips into the water he was turned into a fawn.

Grethel wept bitterly over the poor creature, and the tears, too, rolled down his eyes as he laid himself beside her. Then she said,

"Rest in peace, dear fawn, I will never leave you."

So she took off her golden necklace, and put it round his neck, and plucked some rushes and plaited them into a soft string to fasten it, and led the poor little thing by her side farther into the wood.

After they had travelled a long way, they came at last to a little cottage, and Grethel, having looked in and seen that it was quite empty, thought to herself, "We can stay and live here." Then she went and gathered leaves and moss to make a soft bed for the fawn, and every morning she went out and plucked nuts, roots, and berries for herself, and sweet shrubs and tender grass for her companion, and it ate out of her hand, and was pleased, and played and frisked about her. In the evening, when Grethel was tired and had said her prayers, she laid her head upon the fawn for a pillow, and slept. They lived thus a long while in the

wood by themselves till it chanced that the king of that country came to hold a great hunt there. And when the fawn heard all around the echoing of the horns and the baying of the dogs and the merry shouts of the huntsmen he wished very much to go to see what was going on.

Ah sister said he let me go out into the wood. I can stay no longer!

And he begged so long that at last she agreed to let him go.

But said she be sure to come to me in the evening. I shall shut up the door to keep out those wild huntsmen and if you tap at it and say Sister let me in I shall know you but if you don't speak I shall keep the door fast.

Then away sprang the fawn and frisked and bounded along in the open air. The king and his huntsmen saw the beautiful creature and followed but could not overtake him for when they thought they were sure of their prize he sprang over the bushes and was out of sight in a moment.

As it grew dark he came running home to the hut and tapped and said Sister

sister let me in. Then she opened the little door and in he jumped and slept soundly all night on his soft bed.

Next morning the hunt began again and when he heard the huntsmen's horns he said

Sister open the door for me. I must go again.

Then she let him out and said

Come back in the evening and remember what you are to say.

When the king and the huntsmen saw the fawn with the golden collar again they gave him chase but he was too quick for them.

The chase lasted the whole day but at last the hunt men nearly surrounded

him and one of them wounded him in the foot so that he became sadly lame and could hardly crawl home. The man who had wounded him followed close behind and hid him self and heard the little fawn say

Sister sister let me in. Upon which the door opened and soon shut again. The huntsman marked all well and went to the king and told him what he had seen and heard then the king said

To-morrow we will have another chase.

Grethel was very much frightened when she saw that her dear little fawn was wounded but she washed the blood away and put some healing herbs on it and said

Now go to bed dear fawn and you will soon be well again.

The wound was so small that in the morning there was nothing to be seen of it and when the horn blew the little creature said

I can't stay here I must go to look on I will take care that none of them shall catch me.

Put Grethel said I am sure they will kill you this time. I will not let you go.

I shall do answered he if you keep me here. When I hear the horns I feel as if I could fly.

Then Grethel was forced to let him go so she opened the door with a heavy heart and he bounded out gaily into the wood.

When the king saw him he said to his horse man

Now chase him all day long till you catch him but I'll name if you can any horse.

The king set however without being able to overtake him and he called away the huntsmen and made a list of all who had watched him.



THEY WENT TO SLEEP IN AN OLD HOLLOW TREE

"Now come and show me the hut"  
So they tapped the door, and said  
"Sister, sister, let me in"

Then the door opened, and the king went in, and there stood a maiden more lovely than any he had ever seen. Grethel was frightened to see that it was not her fawn but a king with a golden crown. However, he spoke kindly, and took her hand, and said

"Will you come with me to my castle and be my wife?"

"Yes," said the maiden. "But if I come my fawn must go with me"

"Well," said the king, "he shall come and live with you, and want for nothing."

Just at that moment in sprang the little fawn, and his sister tied the string to his neck, and they left the hut.

Then the king took Grethel to his palace, and celebrated the marriage in great state. And she told the king all her story, and he sent for the fairy and punished her. And the fawn was changed into Hansel again, and he and his sister loved one another, and lived happily together all their days.

## THE FABLES OF ÆSOP THE SLAVE

### THE VILLAGER AND THE VIPER

ONE cold winter's day a villager found a viper under a hedge almost dead with cold. The man had pity on the poor creature, and so he brought it home and placed it on the rug in front of a warm fire. After it had been there some time the warmth revived it, and it at once began to hiss and to threaten to bite the children.

The villager heard his children crying out, and running in he caught up a stick and killed the viper, saying, "Is this the way you reward those who try to save your life?"

*People who are not grateful for kindnesses are unlikely to receive any more*

### THE FOX AND THE GOAT

A FOX one day happened to fall into a well, and could not get out again. Some hours afterwards a goat came to the place, and, wanting to drink, asked the fox if the water was good.

"It is so very good and sweet," said the fox, "that I have drunk so much that I am afraid I shall be ill."

Upon this the goat, without any more hesitation, jumped into the well to drink the water. The fox at once sprang on her back, and so was able to leap out, leaving the poor goat in the well to get out as she could.

*Be careful how you take the advice of people whom you do not know*

### THE BOY WHO CRIED "WOLF!"

THERE was once a shepherd's boy who minded a flock of sheep in the fields. As a mere joke he would often shout out, "Wolf! Wolf!" This caused the men working in the neighbouring fields

to run to the rescue, but after being thus deceived two or three times, they decided to take no notice of his shouts.

Soon afterwards a wolf really came, and the shepherd's boy cried out in earnest. But no one took any notice of his shouts, and so his sheep were killed by the wolf.

*If we tell untruths, no one will believe us, even when we speak the truth*

### JUPITER AND THE ASS

AN ass which belonged to a gardener, and was tired of carrying a load of cabbages to market every day, prayed to the god Jupiter to give him a new master. Jupiter agreed to, and gave him a tilemaker, who sent him every day to market with a heavy load of tiles.

The poor donkey found that his work was harder than ever, so he again asked the god to give him a change. This time Jupiter gave him to a tanner, who treated him more hardly and cruelly than either of his former masters.

When it was too late the ass wished that he had stayed with his first master.

*Be contented with your lot*

### THE FOX AND THE LION

THE first time that a fox saw a lion and heard his terrible roar he was so frightened that he lay trembling on the ground and almost died with fear.

The next time he met the king of beasts he was not so frightened, but ventured to look timidly at him. The third time that the two animals met the fox had lost all his fear, and came coolly up to the lion and entered into conversation with him as if he had been an old friend.

*Familiarity breeds contempt*

# THE PASSING OF KING ARTHUR AND THE BREAKUP OF THE TABLE ROUND

MANY other stories of King Arthur's knights are there and these you may read in books but here we have room left only to tell the end of the Round Table. For this gracious Order of Chivalry which was like a parliament ruling Britain in a goodly manner so that no man dare play the tyrant and none oppress the poor and the weak came to an end and the unwitting cause of it was Queen Guinevere the loveliest lady in Christendom.

For this beautiful lady could not keep her thoughts from dwelling much

the king's will—was tried for treason and was ordered to be burned as a traitor to the king.

But as she stood bound to the stake and the flames began to rise around her Lancelot rode up slew those about her and before her and carried her off. He had saved her but she could not be his for Lancelot loved honour. So he took her to an abbey where she gave up all her life to prayer and holiness and there the greatest knight of Christendom parted from the lovely queen. After that Lancelot retired to Gaul.



QUEEN GUINEVERE IN THE ABBEY GARDEN AT MALMESBURY

This picture is reproduced by permission of the artist Mrs. Mary F. K. photo. has been painted by beautiful picture on page 100.

on Sir Lancelot of the Lake who was the handsomest the strongest and the most courteous of all King Arthur's knights and Arthur loved him as a brother. And so great was Arthur's love that when evil men who hated Lancelot tried to make him think that Guinevere loved the knight more than the king Arthur was very wroth. But these evil men hated their hour and one day when Lancelot was alone with the queen they came in a great number and made an uproar at the door of the queen's chamber crying 'Treason! Treason!' So Lancelot after slaying many of them, had to flee and Guinevere—against

Then the brother of one whom Lancelot had slain forced the heart-broken Arthur against his will to make war on Lancelot. And they fought in Gaul and Lancelot gave orders that none should hurt the king and as often as he saw Arthur dismounted he himself went to his rescue. Many times in the midst of this fierce battle the two great men looked into each other's eyes and exchanged words of love and courtesy.

Afterwards Arthur returned to Britain for his kingdom was in an evil state and there was a great war in the West. The story of Lancelot and the queen had been a poison in the land.

and men forgot honour and courtesy, and had become like beasts. It seemed as if all the king's noble work was undone. The ideals of kindness and chivalry which had given peace, glory, and virtue to the land, were now mocked at as make-believes and foolish notions. The strong trampled the weak. Few cared about honour. There was none to help the weak and oppressed. Sad and heart-broken was King Arthur, who had lost his queen, his favourite knight, and now his kingdom, but he fought in the West boldly for Christ and righteousness, as one who would never surrender, and there was he wounded to the death.

Now, when he was wounded, he called upon Sir Bedivere to carry him to a little church by the seashore, and Sir Bedivere wept, but Arthur comforted him. Then said the king

"Take now my sword, Excalibur, and hasten thee to the side of the water, and sling it into the deep." And Sir Bedivere went away. But the beauty and fame of the sword tempted him, so that he hid it, and returned to the king with a lie. But the king knew that he lied, and sent him a

second time. Yet a second time did Sir Bedivere lie, and the king sent him a third time. Then Sir Bedivere returned, and the king asked

"What sawest thou?"

"I saw," answered Sir Bedivere, "a hand rise from the water, and as the sword hustled towards the waves the hand caught it by the hilt, and brandished it thrice in the air, and afterwards drew it down under the water."

"It is well," said the king.

Then he commanded Bedivere to carry him to the water's edge, "Where the lapping waves floated many an empty helmet and the fitful moonlight fell on the upturned faces of the dead."

And as they reached the shore a great barge came to them, wherein were three queens, all in black with crowns upon their heads. And the queens received the king into the barge, and one took his head upon her lap, and another chafed his hands, and the third bowed at his feet, while the barge drew slowly away across the darkening sea.

And the last words of King Arthur came across the waters to Sir Bedivere, as he was kneeling on the shore "Pray for me"

## LADY AGNES OF ST. DUNSTAN'S TOWER

MICHELNEY is a pretty little village of old-fashioned houses and apple orchards, lying amid the ruins of an abbey, in the marshlands of Somerset.

In the fifteenth century, one of the village lads fell in love with Lady Agnes, of St. Dunstan's Tower, and the two lovers stole away to a priest and were married.

But just as they were leaving the church, Lady Agnes's brothers arrived. Some of them seized the bride and carried her away, and the others attacked the bridegroom, and, thinking they had killed him, they took him into the Muchelney Abbey to die. But he recovered, and after vainly seeking about England for his wife, he returned to Muchelney Abbey, and became a monk, and soon rose to the position of abbot.

One evening, a woman, veiled like a nun, came to Muchelney and asked to see him. She was led into the abbot's chambers, and when they were alone she unveiled her face. He was surprised to see that she was Lady Agnes!

At first the abbot did not know what to do. He was afraid lest the brothers of Lady Agnes should miss her and track her to the abbey, and once more carry her away from him. Now that she had found her way back to him, he vowed that nothing in this world but death should ever again separate them.

The abbot at once hid her in a secret recess in his chamber, and asked her to wait there until he had got everything ready for them to fly away together to some place where their story would not be known. He collected some money and saddled a pair of horses, and then opened the recess, saying "Dearest, we can now depart."

But there was no answer. Opening the door of the recess, he gave a loud cry. His wife was lying on the floor, dead. And twining his arms about her body, he, too, died. The abbot's house, where all this happened, is still standing to-day, but it is now used as an ordinary farmhouse.

## LEGENDS OF THE STARS

In the early ages shepherds tending their sheep and goats hunt men pursuing the hare the bear the wolf and the lion sailors on the wide sea meeting what is an island or a monster or seeking fish fancied that they could make out pictures in the group of stars. They invented stories about them and about wonderfully strong and beautiful beings gods and goddesses who were more than human living high up there in the sky. Here are a few of these legends telling of the star pictures beginning on page 2611.

### AN INDIAN LEGEND

ACCORDING to an Indian legend from California the sun moon and stars are one big family. The sun is the great chief and ruler of the heavens the moon is his wife and the stars are his children whom he has to eat to keep himself alive when he can catch them. But when he is up in the morning they fly out of his sight as fast as they can and dare not appear again until he goes into his hole in the west. He crawls along this hole till he comes to his narrow bed in the middle of the earth. This is so small that it does not give him room to turn round so when he wakes up next day he has to creep out to the east. Then his wife the moon takes her rest.

Every month she grieves when he eats up some of the stars and puts black over her gentle face to show her sorrow. This gradually wears off till by the end of the month her face is bright again. The stars are happy with their mother the moon and sing and dance as she passes among them. After a time other star children disappear and she has to put on mourning again for them.

### ORION THE BILLED GIANT

ORION was a giant who wanted to marry Hero or Merope daughter of Enopion king of Chios but this king who took a dislike to the suitor because of his great height thinking to rid himself of a troublesome person consented to the marriage only on condition that Orion freed the island of Chios from the beasts that raged there. This he did but King Enopion failed to keep his promise and had him lashed. Then Orion was directed by a blacksmith whom he carried on his back to the best spot for faring the ring sun. Grazing it if Orion recovered his sight.

According to one legend Orion through jealousy slew him with his arrows according to another his death was due to the bite of a scorpion which rose from the ground to punish him for boasting of his prowess as a

hunter. He was carried to the heavens and there shines as a constellation of seventeen stars with a glittering belt round his waist and his dog Sirius near him. He is found near the feet of the Bull and is sometimes shown with a club or a sword in his hand and bearing a shield. One of the stories about him is that he piled up a bank on the coast of Sicily to keep out the sea another that he was a worker in iron and made a palace for Vulcan underground.

### THE GREAT DOG

NEAR Orion between the Hare and the Milky Way as far south as we in the Northern Hemisphere can see lies the Great Dog of Orion containing one very brilliant star called Sirius. It used to be regarded as a warning by the Egyptians just as a good watch dog warns a house of coming danger. The dog in the sky could not bark but its bright light let the Egyptians know of any harmful event about to happen.

When they saw the star in the early morning they knew the Nile would soon overflow. So one name they gave it was the Nile star. Of course they knew nothing of the real sources of the Nile then because no one had found them out. Sometimes to show what it was necessary to do on its appearance they pictured the dog as a man with a dog's head a stew pot in his arms a feather under one arm wings to his feet and leaving behind him a duck and a tortoise. The Greeks and Romans associated the Dog star with the heat of summer and said that it burn up the fields and killed the bees. We still talk of the dog days in the hottest season.

### A FAMILY GROUP

THESE are four constellations in the sky standing for quite a family group. Cassiopeia the mother Cepheus the father Andromeda the daughter and Perseus the son-in-law with a little further off Pegasus his winged horse. Cassiopeia foolishly lectured herself to be more beautiful than the



Nereides, and the angry nymphs, in revenge, got Neptune to send a sea-monster to trouble Ethiopia, or Topa, where Cassiopeia lived, for she had married King Cepheus of that country. The story of Andromeda's exposure to the monster, and her rescue by Perseus is told on page 1049. Cepheus, the husband of Cassiopeia, sailed with the famous Argonauts.

Cassiopeia was pictured by the ancients in a southern constellation of thirteen stars, seated on her throne, and holding a palm-leaf in her hand. Cepheus is near here. Cassiopeia, as the constellation is called, can be recognised very easily in the sky in the form of an "m," or, as some see it better, a "w."

#### THE GREAT BEAR

LOOKING at this group of stars, so easily observed, for they never set in the Northern Hemisphere, people fancied they saw in them different objects. So the Greeks said "It is a chariot", the ancient Gauls called it "Arthur's Chariot", the Americans, "The Dipper", the English, "Charles's Wain" or "The Great Bear". There are two bears really, a Great Bear, or Ursa Major, and a Little Bear, or Ursa Minor. This is the legend of how they came there.

Jupiter and Calisto had a son named Arcas. Juno, who was jealous of Calisto, changed her into a bear, and her son by mischance was on the point of killing her. Jupiter, recognising her danger from hunters, changed her into a constellation. Arcas' kingdom was Arcadia, a happy land, where people were taught by their king to till the ground and spin wool. One day while hunting, he met a beautiful wood-nymph in trouble because the tree over which she watched was in danger from a river in flood. Arcas saved the tree by turning aside the current, then he married the nymph, and when he died left his kingdom to his three sons. Jupiter at his death turned him into a bear like his mother, so that he has since kept her company as a constellation.

#### THE PLEIADES

THESE seven stars were associated with seven beautiful sisters, daughters of Atlas, and named Electra, Maia, Alcyone, Taycete, Celano, Merope and Sterope. They all married gods, except Merope, whose light is less bright because she was

wedded to a mortal, Sisyphus, King of Councill. Electra's light also diminished through grief after the fall of Troy, which her son Dardanus had founded.

The word Pleiades comes from a Greek word meaning "to sail," because this constellation shines well in spring, at a good time for sailors to start on a voyage. Because, too, of their association with Ver, the spring, these stars are also called the Virgins. From the earliest times, festivals and seasons were connected with the rising of the Pleiades.

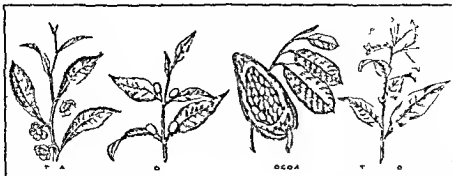
The story runs that, in Boeotia, the giant Orion went in pursuit of the seven sisters, but they prayed to be saved from him, and they were changed into the form of doves. Now they are ever at a safe distance from him in the skies, at the back of the Bull, and behind its protecting horns, where Orion cannot trouble them.

#### HERCULES WITH HIS CLUB

THE celebrated hero Hercules, son of Jupiter, was, of course, bound to be enthroned among the gods in the skies, so the Greeks gave him a place of honour, with his club in his right hand, an apple-branch in his left, in memory of the apples of the Hesperides, and in a kneeling position, with the lyre near his feet.

The legend is that Hercules was fighting one day with stones, but had used them all up. Then Jupiter, seeing the danger of his son, rained down a shower of round stones. These Hercules bent down to pick up, and throw at his enemies, and thus overcame them. This is why he is shown kneeling.

Many are the stories of his prowess and marvellous physical strength, but the most wonderful were his twelve labours, on the performance of which the Delphic oracle promised him immortality. These included slaying the Nemean lion, the Hydra, or water-snake, and the monster birds, capturing a stag with hoofs of bronze and antlers of gold, the boar of Erymanthus, the mad Cretan bull, the mares of Diomedes, Geryon's oxen, and Cerberus, the dog of hell, securing Hippolyte's girdle and the golden apples of the Hesperides. By his own will his body was burned on a pyre, and his spirit passed away in a cloud to Olympus, where he married the goddess Hebe, and became immortal.



## TEA, COFFEE, AND TOBACCO

WE must now discuss a number of substances which are very largely used but which we cannot call foods because we do not find that they add any power to the body or make any of its tissues. If these things did nothing they would not be worth mentioning but though they are not foods they have a very real action upon the body and there are few people who do not take one or other of them every day. We ought to understand their action.

First we must just mention and briefly dismiss the things called condiments. Literally this means *the things given with* and the things that we give ourselves along with our food and call condiments are salt, pepper, mustard, vinegar and so on. Of these the first happens to be a condiment as we say because it has a very decided taste, but we have already learnt that it is an absolutely necessary food without which we must die. But all the other condiments are quite different. They have no food value of any kind; they may be actually injurious by irritating the coat of the stomach.

This is very rare but it may happen when a person becomes, for instance, too fond of vinegar. We take these things not only for their own flavour which we really do not care much about in itself but because they act on the nerves of the mouth and tongue



and now so as to sharpen the taste and flavour of our food. If our appetite is poor this is of service to us. Also these things have a marked effect in persuading the stomach to produce its juices and, if the stomach is not producing enough that is also of good service to us. On the other hand a great many people eat far more than is good for them and the last thing on earth that they ought to add to their food is anything that tempts them to eat more.

No condiment of any kind except of course salt as we understand is good for children. Children have good appetites and good digestion and condiments should be saved up for the time when they have neither. That time is less likely to come at all if the healthy development of the organs of digestion has not been interfered with by adding unnatural things to the food. As we shall see this remark about condiments which is agreed upon by everybody who has studied the food of children applies also practically to all the other things that have to be discussed in this part of our story.

All over the civilised world people drink enormous quantities of tea or coffee or else of drinks made from other plants that really contain the same thing, for the sake of which we take tea and coffee. Of course tea and coffee have very different tastes, and that

difference must be due to something. Certain volatile oils occur in the tea-plant which are quite different from those in the coffee-plant. These oils have a very pleasant taste and flavour, but they are not very important in their action on the body. The thing that really gives tea and coffee their attraction is the same substance in both of them, and it exists in several other plants. It is sometimes called *theine*, and sometimes *caffeine*. This is a wonderful substance, and, so far as we know, there is nothing else like it in the world. It is the only true stimulant of the brain that has yet been discovered. Other things, such as alcohol, will appear to stimulate the brain, but that is only appearance, as we shall see. Caffeine, however, really makes the brain work better; it produces no reaction afterwards, and just because it is the only true stimulant of the brain, it is the only drug we know which, by its pure action on the brain, will keep people awake.

#### THE STIMULATING DRUG THAT HELPS THE STUDENT TO KEEP AWAKE AT NIGHT

Medical students working for examinations sometimes take not merely tea or coffee but pure caffeine itself, which is a bitter-tasting white powder, and swallow large doses of it at night in preparing for an examination. I do not say that this is a wise thing to do, but it will keep one awake, it will enable a man to read and work hard for hours when, without it, he could not possibly have kept his eyes open, and the only result that appears to follow after a long time is that the drug becomes rather less effective.

All this is not to say that we may not hurt ourselves with tea and coffee, because we often do. For one thing, people who are not working for an examination, and whose difficulty is not to keep awake, but to get to sleep, hurt themselves by taking these things. Bad sleepers ought either to make it a rule to take no tea or coffee after five o'clock, or after midday, or, better still, to go without altogether.

Then, again, many people hurt themselves with tea not because the caffeine does them any harm, but because the tea-leaf contains a great deal of a curious substance called tannic acid, or tannin, which is bad for the digestion. If we put a little pure tannin into the mouth,

we can feel at once how it dries the mouth up, and it does the same in the case of the stomach. This means that the digestive juices cannot be properly produced. If we allow for the possible interference with sleep, and for the interference with digestion, we account for the whole of the bad effects that may follow the frequent taking of tea.

#### THE RIGHT AND THE WRONG WAYS OF MAKING TEA

China tea contains less tannin than other tea, but the really important thing is the way in which tea is made. Careful experiment has shown that in about three minutes boiling water will extract practically all the caffeine in the tea-leaf, together with plenty of flavouring matter. In this period of time very little tannin is extracted. If we go on infusing after this, we get nothing more that is pleasant or useful, but we do get far more tannin, more and more indeed gets into the water for as long as three-quarters of an hour, and there is far more after five minutes than after three. It is very wrong to boil or stew tea. It should be infused, which means that the boiling water should be poured upon it, and it should not be infused a moment longer than four minutes at the outside. The Chinese, to whom we really owe tea, say that the best water for making it with is that from a running stream, and the worst is well-water. The reason is that one should use water which has plenty of gases in it. If we allow the kettle to go on boiling, we drive off these gases, and make the water flat, and spoil the tea. We should use the water directly the kettle has come to the boil.

#### THE WAY TO GET THE BEST VALUE INTO A CUP OF TEA

If we have to use water which is flat to begin with, we should pour it from a height, from one jug to another, so that it can take up some of the gases from the air. If the water is hard, a pinch of baking-soda should be added to the teapot. Tea-tasters use a smaller proportion of tea than most of us do. The teapot should be thoroughly hot, for if the water falls much below the boiling point while the infusion is going on, some of the things in the leaves which give the tea its best flavour do not get into the water. We should never make a second brew, for it is

certain that the first brew takes away from the leaves every thing worth having. Anyone who cares to attend to these rules about the making of tea will get a far more delicious drink from cheap tea than can be got from tea costing twice as much but wrongly made.

I let us remember too that properly made tea is very nearly the most innocent drink in the world and in many respects and for most people is actually beneficial. In Great Britain we drink about four million gallons of tea every day and the very small amount of ill effect that can fairly be put down to this gigantic consumption is due to the fact that many people are so careless in the way they go about it.

So far as caffeine is concerned coffee and tea do not differ very much—that is to say coffee made with milk contains about a grain of caffeine to the cupful and the rate in tea is about the same. But of course if we drink strong black coffee we swallow a good many grains of caffeine every day. There is a special and powerful volatile oil in coffee which upsets some people so that they cannot drink coffee though they can drink tea.

#### THE HARM THAT COMES OF BAD TEA AND BAD COFFEE

Our commonest mistake in making coffee is that we make it too weak. The berries should be freshly roasted neither too much nor too little and they should be ground just before they are used. The same rules apply to the water as in the case of tea. Metal apparatus especially if it is complicated is bad. It is often difficult to clean and then the stale coffee spoils the new brew. If the coffee is allowed to stand for a little there is no need to filter it. A simple earthenware vessel is the best. If anyone finds that he is not sleeping as he ought to do and if he is a coffee drinker that is the very first thing that he should cut down.

Though black coffee is decidedly stronger than tea it is very much less injurious—if injurious at all—than improperly made tea. Hundreds and thousands of gulps ruin their digestion by taking tea from a kettle kept on the fire all day but it is the tannin and not the caffeine that is to blame. There is not much tannin in the coffee bean.

No child should take tea or coffee.

I do not say that older children are necessarily hurt by occasionally taking a little very weak tea but they are safer without it. The bright active brain of a child always on the go has no need to be stimulated and these things are only stimulants not foods. Also in encouraging children to take these things we interfere with their contentment in taking really important things like milk. Again many a child who has tea late in the day is found to be excited and unsleepy at night and the tea is the real reason.

#### WHY CHILDREN MAY DRINK COCOA FREELY WITHOUT HARM

Cocoa differs from tea and coffee in one or two important ways. It also contains a substance which is closely related to caffeine but it is so weak a stimulant that it is not worth mentioning and therefore we may freely permit children to drink cocoa though we forbid them tea and coffee. This is a very important point because children like hot things and hot drinks are often very good for them and if we flavour hot milk with cocoa we can persuade them to take it better. It is wonderful how much milk and sugar we can get in side a child with the help of a substance like cocoa.

Many people suppose that cocoa itself is a useful food but as a matter of fact we do not use much cocoa in the cup and what there is quite unimportant as a food. The fat in cocoa which is useful in its small degree is often apt to upset the digestion and so many children will not touch cocoa. It is worth knowing that different kinds of cocoa differ a good deal in the way they are made and the child who refuses to take one kind will perhaps quite readily take another which may for instance contain less fat of the bean.

#### CHILDREN MAY EAT CHOCOLATE FREELY IF THEIR TEETH ARE PROPERLY CARED FOR

To praise cocoa is to praise chocolate which is a splendid food. When we take chocolate we are not merely taking solid cocoa with such food value as it has but we are also taking a very large quantity of sugar. Our school is when fighting in South Africa learnt how pleasant and how sustaining chocolate is. Most children love chocolate and are quite right too. The plain chocolate which is the best is really better.

for children, both as a food and for other reasons, than cream and fancy chocolate bonbons. We often notice that some children are wise enough to prefer plain chocolate to the elaborate and fancy things which tempt their elders. If children's teeth are properly used and properly cared for, the sugar of chocolate need not be feared. Far the finest teeth in the world among human beings belong to negroes, who very nearly live on sugar-cane.

#### ALCOHOL AND TOBACCO ARE NOT FOODS, BUT POISONS

We have already learnt that we are bound to study from the food point of view every thing that enters the body, whether it be what we usually call a food or whether it be a gas, such as the air which we breathe. Many of us are in the habit of taking into our bodies various substances which are not foods, but which we take as if they were foods, and which we certainly ought to understand. The most important of these things are tobacco and alcohol.

Nowadays there are a good many others which a certain number of people take, but we need not discuss them, especially as what is true of tobacco and alcohol is largely true of them. These substances are both poisons, in other words, a sufficiently large dose of them—the exact amount depending upon the weight and age of the particular person, on whether he has taken the drug before and so forth—will kill. That the smoke of tobacco is a poison no one questions, though a great many people who know nothing about the subject question whether alcohol is a poison. They think it is absurd to call alcohol a poison, because many take it daily without being killed.

#### THE POISON THAT WILL KILL AND THE POISON THAT WILL NOT KILL

But for every poison in the world there is a dose that will kill and a dose that will not. This is true, for instance, of the carbonic acid in the air we breathe. Carbonic acid is a poison, but it will not kill except in the poisonous dose. In lesser doses it merely injures, or else the body resists it altogether, and is not hurt. But when the body has to do this with anything that threatens it, it has to pay a fair price. Tobacco is the leaf of a plant, and this leaf contains various substances,

including a special one called *nicotine* which, when given by itself, is intensely poisonous. It seems to be true of both nicotine and alcohol that they are poisons in their degree to every form of life. A third of a grain of nicotine has killed a man. People who take tobacco may smoke it, or they may chew it, or they may grind it up and take it in the form of snuff. It does not matter for us here in what form the tobacco is taken, for the results are the same. Of course, we understand that when the leaf is burnt, great chemical changes must be produced in it.

People have said that the nicotine and the other poisons in tobacco smoke must be burnt up, when tobacco is smoked, or oxidised away into carbonic acid and water. But anyone who tries to smoke a pipe for the first time will soon discover that something very curious gets into his body, and it has lately been proved conclusively that tobacco smoke *does* contain nicotine.

#### THE GREAT DANGER OF THE POISONOUS NICOTINE IN TOBACCO

The nicotine is destroyed in the tobacco that is burnt, but somewhere between the place where the tobacco burns and the smoker's mouth, the nicotine is made hot and turned into gas and sucked in. If the smoker merely drew nicotine into his mouth, and then puffed it out again, there could be no consequence except upon his mouth itself. The effect of smoking depends not upon what is drawn in, but upon what is absorbed, just as the effect of eating depends not upon what is swallowed, but upon what is absorbed.

However, nicotine is a very volatile, quick substance, and easily passes through the lining of the mouth into the blood. Unwise people sometimes have the trick of breathing tobacco smoke right into their lungs instead of merely sucking it into the mouth and puffing it out again, and they will even teach boys how to inhale the smoke of cigarettes for themselves. This is very difficult to stop once we start doing it. It means that far more of the things in the smoke are absorbed, because the whole great surface of the lungs—equal to 2,000 square feet, as we know, if it were spread out—is exposed to the smoke, and it is a surface that is specially made and suited for transferring

gases from one side of it to the other. Also directly the smoker starts in haling this means that the smoke is now passing between his vocal cords as they are called, with which he speaks or sings. Smoke is crowded with solid particles which are caught on the vocal cords. Many of the gases in the smoke are very irritating and all are hot.

#### HOW TOBACCO SMOKING SPOILS THE VOICE AND ENDANGERS THE LUNGS

Thus everyone who regularly inhales tobacco smoke is absolutely certain to spoil his voice sooner or later even if nothing worse happens. It would be very easy to exaggerate the ill effects of ordinary smoking but there is a very great difference indeed as we now understand between puffing smoke in and out of the mouth and inhaling it between the vocal cords into the lungs. Anyone who teaches and encourages a boy to do this is not that boy's friend but his thoughtless and cruel enemy.

Enormous numbers of grown up people smoke without its being possible for anyone to show that they do themselves any harm. As in the case of many other poisons the first effects do not return. We have already learnt how marvellous is the power of living creatures to adapt themselves to circumstances. So as a rule the body learns in a short time how to take the gases of the smoke without being upset by them. The scientific way of saying this is that the body acquires immunity against the poison. The same applies to many other poisons such as opium. In the case of opium and some other poisons the dose has constantly to be increased. This is not so much noticed in the case of tobacco.

But in the case of all these substances the rule is that at a certain time after we have taken the dose which satisfies us we find that we want another dose. Certain changes which we are now beginning to understand occur in the body.

#### WHY A SMOKER BECOMES RESTLESS AND WHY TOBACCO SOOTHES HIM

What happens appears to be that the original poison such as the nicotine or the morphin of opium is broken up inside the body and another substance is produced which has just the opposite effect upon the body. This may sound peculiar but in point of fact we know scores of plants containing two

oppositely acting substances one of which is derived from the other. So what happens in the case of the smoker is for instance that the nicotine forms an opposite of nicotine which makes him just a little restless and uneasy and then when he takes some more nicotine—that is to say when he smokes again—this makes him feel restless and contented. So there is established what is usually called a vicious circle. It is very often pointed out and quite truly that smoking has a good effect upon a man because it makes him feel more contented and restless and improves his temper. Quite so but we ought to add that the reason why he wanted these things done for him is that his temper and contentment had been upset by the after results of the last time that he smoked.

A man may have smoked for many years and yet in only a few days if he stops altogether he may lose the craving just because his body gets rid in that time of the last remains of the things that are made in it which make him want to smoke again. After smoking without a break for fourteen years the writer has just made this experiment upon himself and so he knows that what has been said is true.

#### THE GREAT ADVANTAGE OF NOT SMOKING AT ALL

Most smokers know in their hearts that they smoke too much and wish to cut the amount down. There are various ways in which they may do this. It is good for instance to make a rule about smoking only after meals or only after a certain hour in the day or to make a rule of not craving. It becomes about in one's pocket. Many people have found that if they suck strong peppermint lozenges this helps them to cut down their smoking.

All authorities on the subject will admit that it is best not to learn to smoke at all. No one can call smoking natural no one can prove that it does any good except to relieve the symptoms which it has itself created and which the habit of them will again create and even if there be no injury done to life which may well happen in cases of tobacco blindness tobacco heart weakness and so on there is always a certain amount of injury done.

to the pocket. But even supposing that anyone tried to argue that smoking was really a good thing for grown-up people at any rate no one would dare to argue that it is good for children, or young people of any age or of either sex. No one can say that the child needs the tobacco—no one can show that the tobacco does the child any good. All the likelihood of course, is that the developing body will be more injured than the already developed body. That is true without exception of every poison or injurious substance known, and is equally true of all living things, plants, animals or human beings.

#### THE THINGS THAT MAKE A MAN AND THE THINGS THAT MAKE A SHEEP

Tobacco being a poison, no boy enjoys his first experience of it. He is encouraged to go on by an argument which would be quite the best argument in all the world if it were true. It is, that he should "be a man." This argument is applied to boys about things far worse than tobacco smoking. The boy is to smoke or drink, or whatever it be, because others who are older than himself do it, and so they say he will prove himself as much a man as they are. The real mark of a man is not that we should smoke, or drink, or shave, or be six feet high, the real mark of a man is to be ourselves, to do things or not to do things because we so think fit, and the mark of not being a man, however old or big we are, is to do things because other people do them. So when they say "be a man," they really mean "be a sheep", and that is what we should reply in such a case. This is a very important matter because it applies to many other things besides smoking; and it would be quite important enough even if it only applied to that.

#### THE KIND OF BOY WHO IS A REAL MAN AND MAKES HISTORY

The writer remembers, as if it were yesterday, his feeling of being grown-up and manly, and as clever as older boys, when he first smoked. No one expects boys to have the sense of men, and it is natural for boys to feel manly in such a case when older boys admire them. But the difference between a real man and a sheep remains; and, if it comes to that, just as a grown-up man can be a sheep, so a boy can be a man at any age, not by making himself

feel miserable in doing the things grown-up men do, but by deciding for himself what to do, and what not to do, without reference to foolish people. It is this kind of boy and this kind of man that makes history, that has made the world what it is worth to-day, and will make it worth more in the future.

There has been a good deal of talk in England during the last few years about this question of children smoking, and it has been agreed by everyone that it ought to be stopped. It is not at all easy to do, because the proper way to do what is needed for children is through their parents, and there are children whose parents do not care—babies in perambulators whose mothers give them beer to sip, and little schoolboys whose fathers are quite proud to see them smoke a cigarette. However, since the beginning of April, 1909, there has been in force a law which deals with children smoking, and which will do something, at any rate, to protect children from themselves and from foolish people in this respect.

#### THE KNOWLEDGE THAT HELPS US TO DO RIGHT AND ACT WISELY

Any child under sixteen found smoking in the street or in a park must be stopped by the policeman or the park-keeper and any boy so found smoking may have his pockets searched. Tobaccoists will be punished if they sell cigarettes to children. No doubt this is quite a proper law, but we must not forget the usefulness of knowledge, and the wisdom of trying to make people sensible so that they can govern themselves. It is a thousand times better for a boy not to smoke because he has learnt about smoking, and has decided that it is more sensible for him, on the whole, not to smoke, than not to smoke because he is never sure whether there is a policeman round the corner. There are always these two ways of getting people to act properly, and no doubt the way of compelling them from the outside is often necessary, but the people whose lives are worth most to themselves and to the world are those who govern themselves wisely from within, and knowledge has its highest value because it helps them to do so.

The next part of this is on page 349r.



This famous picture of the Last Supper was painted on a church wall in Milan by Leonardo da Vinci.

## THE BETRAYAL OF JESUS

JESUS sat at supper with His disciples for the last time. He was clothed with serenity. Neither His manner nor His words betrayed anxiety. The same gracious restfulness which had characterised His life of struggle with old Israel characterised Him now.

But there was in the Master this night a certain sadness which was noticed by the friends about Him. He spoke in the manner of one taking a farewell. He looked in the faces of His companions with a long and wistful tenderness. They knew that the hour of crisis had come. They knew that after the scenes in the temple and the streets of this great city the priests would do something to check their Master. Presently He said:

One of you which eateth with me shall betray me.

The words searched the consciences of His disciples. There was not a man there who had not doubted who did not feel misgivings about the reality of Jesus as King of the Jews. Only one among them let us believe had ever contemplated an actual betrayal of Jesus to the Jewish authorities but none of them we know was wholly innocent of doubt.

Jesus took bread, blessed it, broke it and gave it to His disciples saying:

Take, eat, this is My body. And He took the cup and gave it to them

and they all drank. This is My blood of the New Testament, said Jesus, which is shed for many. Verily I say unto you I will drink no more of the fruit of the vine until that day that I drink it new in the Kingdom of God.

The company was saddened by these words and the feeling grew among them that the end was indeed close at hand. Gradually they saw that Jesus expected arrest that night. They sang a hymn together and then Jesus led them out to the Mount of Olives.

The darkness and the stillness came about them. They walked in silence wondering what the end would be.

The voice of Jesus broke softly upon their anxious thoughts.

All ye shall be offended because of Me this night. And He added: It is written I will smite the shepherd and the sheep shall be scattered.

To night! It was to come this night. Their Master was to be taken this very night.

The disciple Peter was first to speak. 'Although all shall be offended yet will not I.'

The loyalty of his strong and impetuous nature was touched by the pathos and the sadness of his Master. But Jesus said in His quiet gentleness: Verily I say unto thee that



this day, even in this night before the cock crow twice, thou shalt deny Me thrice."

Peter was prompt with protest. Vehemently he exclaimed, "If I should die with Thee, I will not deny Thee in any wise."

There was a murmur of approval from the others. All of them said that they would not forsake their Master.

#### THE SHADOW OF THE GREAT SORROW THAT FELL ON THE GARDEN OF GETHSEMANE

They came presently to a garden which was called Gethsemane. They were worn and tired. The toil and the journey and the anxieties of the day began to weigh upon them. Over the heads of these houseless men the stars twinkled, and round about them glittered the lamps of the sleeping city. Even the fear of Roman soldier and Jewish priest could not dislodge from their senses the craving for rest.

"Sit ye here," said Jesus, "while I shall pray."

He drew to Him three of the number Peter, James, and John, and, leaving the others to sit down under the trees, advanced farther into the shadows and silences of the garden.

When He was gone some distance from the others, He gave way to the distress of His soul, and spoke openly with the three of His impending death.

"My soul is exceeding sorrowful unto death," He said. They saw with their eyes the suffering and the heaviness of which He spoke. They realised now that He expected His enemies that night.

"Tarry ye here," He said, "and watch."

He went forward a little, and fell on the ground and prayed to God, whom He had served so faithfully, that if it were possible the hour might pass from Him.

#### THE PRAYER OF JESUS IN THE BITTER HOUR OF TRIAL

"Abba, Father," He prayed, "all things are possible unto Thee; take away this cup from Me. Nevertheless, not what I will, but what Thou wilt."

The terrible hour of trial had come to Him. The cup of death was being offered to His lips. It was the end!

He might have escaped. All the malice and hatred, and power arming themselves to kill Him would have

been gentle to Him if He had said "I am not the King." It was not necessary for Him to die. He might live on and preach the righteousness of God among the villages. He had only to lay down His Kingship.

But that Kingship was something that He could not give up. It was His throne, from which He would reign throughout the ages in the hearts of the good and the kind, His throne, from which throughout the ages He would comfort the sorrowful and encourage the weak to be strong, was the cross of death.

He returned to the three companions of this last watch, and found them sleeping. Perhaps their indifference to His danger, and their oblivion to His spiritual agony, plunged His soul once more into the darkness and loneliness of His conflict. Even these chosen three slept while He suffered, slept while His enemies advanced to take Him.

"Simon, sleepest thou?" He said to Peter. "Couldst not thou watch one hour?"

#### THE FRIENDS OF JESUS SLEEP WHILE THE LAST HOUR DRAWS NIGH

Then this failure of Peter to keep watch was turned by the Master into a lesson for that disciple's eternal good.

"Watch ye and pray, lest ye enter into temptation. The spirit truly is ready, but the flesh is weak."

Then, as the hour had not yet come, He went away again, and once again prayed to the Universal Father.

Again He found His friends sleeping. A third time, and still the weariness of their bodies was greater than their love. The most precious being that ever lived our human life was in agony of mind and body, was on the threshold of suffering and death, and they could not keep their eyes open.

"Sleep on now," He said gently, "and take your rest."

Perhaps He thought the danger was over, that at least for this night He was safe. But as the words left His lips He saw a flicker of lights in the distance, and heard the muffled sound of men's voices advancing through the gloom.

"It is enough," He said. "The hour is come! Behold, the Son of Man is betrayed into the hands of sinners. Rise up, let us go. Lo, he that betrayeth me is at hand."

# JESUS IN THE GARDEN OF GETHSEMANE



**JESUS PRAYING WHILE HIS DISCIPLES SLEPT ON THE NIGHT OF HIS BETRAYAL**

As the trial of His life approached, and the tragedy of the Cross grew nearer, Jesus led His disciples away to the Garden of Gethsemane, where, in the dead of night, and quiet of the night, He withdrew alone to pray. "Abba, Father," He cried, "take away this cup from Me; nevertheless, not what I will, but what Thou wilt. If it is Thy will, let this cup pass from Me, yet not My will." It was here, in the Garden of Gethsemane, that Jesus, in His agony, shed the precious blood that won the victory over death.

This picture is reproduced from the painting by Raphael, the great cartoon artist, by permission of the Vatican Museums.

The startled companions rose hastily to their feet, expecting an enemy.

Through the gloom of the garden they saw advancing toward them the face of a friend. It was Judas Iscariot.

Judas Iscariot had led Jesus and the other disciples before they quitted the room of the Last Supper and through the dark streets of Jerusalem had made his way in great haste to the chief priests of the Jewish religion.

could seize Him, drag Him to trial, and get Him executed before there was time for the multitude who followed Him to rise. "When He is dead," they argued, "there will be an end to this blasphemous idea that He is King of the Jews." They had no faith in Jesus. They were perfectly honest in their antagonism. They told Judas that if he could really do what he promised, they would pay him money.



JESUS FINDS THE DISCIPLES ASLEEP IN THE GARDEN OF GETHSEMANE  
This picture is reproduced by permission of the artist Mr. John H. F. Bacon, A. R. A.

He made to these proud authorities of Israel the offer to assist them in arresting Jesus without creating an uproar among the people.

The chief priests eagerly embraced this offer of Judas. It was the very thing they desired. Long ago, and on many occasions, they might have arrested the preacher, but they held back for fear of a disturbance. Any serious clamour among the people would have angered the Roman governor, and lost them their liberties and privileges. They wanted to destroy Jesus; they feared to anger the hated Roman.

But now, here was a man who offered to show them how this troublesome preacher might be arrested at night without anyone raising a cry. They

A company of them came together, Levites of the temple guard, Roman soldiers, some of the priests, and a retinue of servants. Torches were lighted, and accoutrements fastened. With the betrayer to show them the way, this little army of the night set out for the Mount of Olives.

There was to be no mistake in the darkness. "Whomsoever I shall kiss," said Judas, "that same is He. Take Him, and lead Him away safely."

It seems as if the intention of Judas was to deceive both Jesus and the other disciples. He would advance among the soldiers, as if forced to obey them and in his emotion would embrace the Master he had served through the difficult years of His mission.

This is how it came about that the sleeping disciples roused by Jesus with the ominous words "The hour is come" looking up beheld the familiar face of their companion Judas.

Jesus stood in the midnight in the midst of the garden and waited.

Judas advanced. He ran to Jesus. "Master! Master!" he cried and kissed Him.

**JESUS IS BETRAYED TO HIS ENEMIES AND DESERTED BY HIS FRIENDS.**

The next moment Jesus was seized.

Peter grasped a sword and struck at one of the soldiers. Jesus rebuked him. Then turning to those who surrounded Him, He asked:

"Are ye come out as against a thief with swords and with staves to take Me?"

He looked at the priests.

"I was daily with you in the temple teaching, and ye took Me not."

The exceeding meekness of this reply to arrest scattered the disciples. The saddest words written in the history of the human race are those which follow this gentle reproval of Jesus:

*And they all forsook Him and fled.*

The courage of these poor weary and stumbling heavy men vanished in the darkness as they beheld their Master meek and lowly in the hands of a few soldiers. Where was His kingship? The dream vanished, the hope died.

They all forsook Him and fled.

Through the garden—who has drawn us the sad and dreadful picture of the faithful companions of the great Teacher hurried with fear and disillusion in their hearts leaving Him alone with His enemies. What painter can show us the face of St. Peter moving through the shadow of the garden his back to Jesus? The procession moved on. Down the

slope of the hill leading to the valley of Kidron it made its way through the darkness towards the city of Jerusalem. A young man following at a distance was observed by the suspicious eyes of a priest. A servant was sent to arrest him. This servant had hold on a linen garment worn by the stranger, but the stranger flung himself free and escaped in the darkness. The garment remained in the servant's hands. The stranger escaped. Who he was nobody knew, but he was the last to follow Jesus.

The procession entered the sleeping city and passed through the dark streets without arousing alarm. If the priests expected Jesus to call aloud on the multitude of outcasts who loved and followed Him, they must have been amazed by His perfect and yielding silence. He walked silently in their midst.

**JESUS IS BROUGHT BEFORE ANNAS IN THE HOURS OF THE NIGHT.**

The priests had determined to let no time pass. Their hated and dangerous prisoner was to be tried that very night. The soldiers marched Him before the old man Anna, who acted as high priest. He was to be condemned immediately.

The old priest looking on Jesus inquired of His teaching.

Jesus refused to answer. His testimony had been given in the temple and in the synagogues. Those who had heard Him must be the witnesses.

A soldier standing by struck Jesus.

"Answerest Thou the high priest so?" he demanded indignantly.

Jesus answered: "If I have spoken evil, bear witness of the evil; but if well, why artest thou Me?"

Then Anna sent Him bound to Caiaphas, the real chief priest of the Jews.

The next little scenes are in the



JUDAS GOING OUT



THE ARREST OF JESUS



GETHESEMANE

I have prepared this separation. I have paintings by Stone. I say by good-bye to Mrs. W. A. W. in which picture is they are

# THE FATHER OF ENGLISH POETRY

GEOFFREY CHAUCER READING POEMS FROM HIS  
CANTERBURY TALES AT THE COURT OF EDWARD III.



Chaucer, the first great English poet, lived in the 14th century, before the days of printing. The poet was a favourite at the court of King Edward III, and at times he would read his poems before the king and his courtiers, in the way which Ford Madox Brown, the celebrated painter, has illustrated so happily in this picture.



William Shakespeare with other figures of his time

# FOUR GREAT ENGLISH POETS CHAUCE—SPENSER—SHAKESPEARE—MILTON

It is well to know something of the lives of our great poets not merely because they may be interesting to us as men but because in knowing their lives and remembering the periods of time in which they lived and wrote we are gaining something towards the understanding of our national literature. Thus if we remember that the first really great English poet was Geoffrey Chaucer who was born about the year 1330 we shall always have his lifetime fixed in our mind as an important period in the history of English literature. It is true that before Chaucer there were many poets but most of them were of the monkish class who wrote the Latin tongue and none of them compare with Chaucer for lively imagination knowledge of life and broad sympathy with their fellow men. One of the most notable of these very early poets was Chaucer about whom we have already read in the CHILD'S BOOK OF POETRY page 313.

As Chaucer is very rightly called The Father of English Poetry we cannot do better than begin with

him. Naturally there is not a great deal to be told of the life of a poet who lived more than 500 years ago. His works are the chief means we have of discovering the character of the poet and through them we get to know that Chaucer must have been a very hearty good natured laughter loving sort of man who did not take life too seriously or yet too lightly. Indeed if we may judge him as a man by the impression which his poetry leaves on us we can say that Chaucer was in every sense a typical Englishman not only of his own time but of all time.

He loved the simple things of life he rejoiced in the beauties of Nature he was fond of his books and liked to be comfortable at home. He could laugh with the merryest at any tale of roguery but he had his serious side and a reverence for religion. These are all qualities that may be found in the true Englishman and it is this that through his writings we can form some idea of the character of the man.

It is true that the name of Chaucer is not an English name and his mother

forefathers may have followed William the Conqueror from Normandy into England, as the name was evidently of French origin. But however that may be his father, John Chaucer, was a citizen of London and a wine merchant there at the time of Geoffrey's birth. Geoffrey must have come of a good family, for he had the education of a gentleman, but we do not know whether he was a scholar of Oxford or Cambridge, although he has been claimed for both of these universities.

#### HOW EDWARD THE THIRD HELPED TO PAY THE RANSOM OF CHAUCER

As a young man he would seem to have been of very attractive character, for he became a great favourite at the court of Edward III. and was taken a prisoner in France when following the king as a soldier, the king himself showing his interest in his follower by contributing £16, which at that time was a considerable sum of money, towards his ransom. But the young poet was more particularly a friend and follower of the king's son, John of Gaunt, and by his marriage, at the age of twenty-six, to Philippa de Rouet he became brother-in-law to that famous prince. We may suppose, therefore, that, although we only know of his father as a prominent citizen and a seller of wine, the Chaucer family was of sufficient eminence for Geoffrey, with his many native gifts, to find the way open to success at the king's court.

Indeed during the reign of Edward III. his life was filled with prosperity, and he held various posts in the service of the king, and went abroad at different times as ambassador.

#### CHAUCER'S VISIT TO THE CONTINENT AND WHAT HE LEARNED THERE

It is thought that on one of these missions, when in Italy, he may have met the great Italian poet Petrarch, who was one of the foremost figures at that time in the mighty movement which we describe as the Renaissance. This word really means a re-birth, and by the Renaissance is meant the renewal of intellectual energy, the flourishing of a new love for the beautiful things of the mind, which are expressed in great literature, painting, and sculpture. For long ages after the decline of the ancient learning and arts of Greece and Rome, these beautiful things had, like the

plants in the winter-time, been asleep, but in the age of Chaucer they had, as it were, shot up again and burst into flower. Italy was the centre of this new flowering of the arts, and it was Chaucer's splendid work to import into English literature something of this new spirit which had arisen on the Continent.

But we must remember that he was not a writer for gain, as most writers are in later times. His was the life of a courtier and a gentleman, and his writings were the fruit of his leisure, the expression of his own joy in life. Nor were his days all smooth and easy, as he did not find King Richard II. so kind to him at first as Edward III. had been, but after a time he gained the favour of that monarch, and when Henry IV., the son of his old friend, John of Gaunt, came to the throne, he again enjoyed prosperity, although towards the end of his life he seems to have known the want of money at times. Whatever his troubles may have been, they never lessened his love of poetry, and some of his finest pieces were written in the autumn of his days.

#### THE DEATH OF CHAUCER AND THE BIRTH OF SPENSER, THE NEXT GREAT POET

Chaucer died in 1400, and as he had lived before the invention of the printing press, his writings during his lifetime had circulated only in handwritten copies, but about seventy-five years after his death the famous printer, William Caxton, brought out the first printed edition of "The Canterbury Tales." A selection of stories from these has been printed in the CHILD'S STORY OF FAMOUS BOOKS, page 633.

After the death of Chaucer, many years passed before another great poet arose in England. Indeed, the century and a half between his death and the birth of Edmund Spenser is often described as the "twilight of genius," by which is meant a time when there were no men of great gifts devoting themselves to the art of literature. Perhaps the reason for this lay in the fact that for many years England was torn and distracted by civil war, and men had but little time for the gentler things of life. But when Edmund Spenser arose as a new poet, he heralded the coming of the greatest outburst of poetic genius in our country's history. He was really the first of the great Elizabethan poets.

## SPENSER READING HIS POETRY TO RALEIGH



Edmund Spenser was the herald of a great revival in English poetry. In his poem we can trace a sort of English language as it was written by Chaucer while he has brought the modern English to blossom in Spenser's poetry within sight of perfection. Spenser at one time of his life experienced good fortune as a friend of many noble men although he died in poverty. In the above picture we see him reading his poetry to Sir Walter Raleigh.

Edmund Spenser was born in London most likely in 1552 or 1553 and came of a family of some distinction though he was not born to worldly riches. He was educated at the Merchant Taylors School and was thus perhaps the first of the many famous men to pass through the school which had then been but recently founded. He was a student at Cambridge and later because some young lady would not have him for a sweetheart he turned to his study and the writing of verse in order to forget his disappointment. Many a one has done that since and produced the most deplorable verse. But Spenser happened to be a genius thus wrote *The Shepherd's Calendar* which was published in 1579 and has justly been described as the first clear note of the great Elizabethan poetry.

A warm and intimate friend of Spenser's was the heroic Sir Philip Sidney himself a charming poet and it was due to his influence that Spenser in 1580 received an official post in Ireland, where the remainder of his short life was passed for the most part in pleasant circumstances. His fame

as a poet rests on a great work of poetry now more often spoken about than read.

*The Faerie Queen* from which we have read several stories in the *CHILD-STORY* or *FAMOUS BOOKS* page 109. The first three parts of this work were published in 1590 and made his name famous even in his own day. But the end of his life was sad for during a rebellion in Ireland the castle in County Cork where he resided was burned by the rebels and Spenser had to flee.

Coming to London it would seem that not all his fame could find him new friends in the hour of need, for he died at a tavern in King Street Westminster on January 13 1599 for lack of bread according to Ben Jonson another the great poets who lived in Spenser's day. Spenser was buried in the Poets Corner of Westminster Abbey. Then he rests among those for whom he chiefly wrote as he is often called.

*The Poets' Poet* because thoroughly to understand and appreciate his writings one must be something of a poet oneself. And he lives in literature not so much as a poet for all to read but as a great and beautifuly rhyming poet.



writers, both of prose and poetry. The trouble now is not to name the famous poets, but which to leave out, for following Spenser they come so thick and fast, and so many are worthy of attention, that but for the mighty name of Shakespeare, which overtops them all, it would be difficult to pick and choose among the poets of Elizabeth's time.

### SHAKESPEARE THE GREATEST POET IN A GOLDEN AGE

There are Michael Drayton, Christopher Marlowe, Ben Jonson, Philip Massinger, Francis Beaumont, John Fletcher, John Webster, George Chapman, and others who, in an age when no giant so good as Shakespeare had lived to overshadow them would all have seemed even greater men than we know them to have been.

But from this great and rich period of English poetry we are forced to take Shakespeare alone, and in him we have the essence of the whole, for all that was finest in the Elizabethan age is reflected and made immortal in the plays and poems of Shakespeare. At that time the stage rather than the study was the aim of all the poets. In the new energy which had come to old England, the poets, inspired by the mighty deeds of Elizabeth's victorious sailors who were opening up a vast and wondrous empire for England had to choose models for their art, and they went back to the ancient days of Greece, when the poets wrote plays to be performed in the theatres of that wonderful land. That is why we call the revival of learning in Elizabeth's time a "classical revival." The chosen model of Shakespeare and his fellow-poets was the Greek drama, and in this respect the Elizabethan renaissance differs from the earlier renaissance, of which Chaucer was the finest product in England.

### THE LITTLE THAT WE REALLY KNOW ABOUT THE LIFE OF SHAKESPEARE

One of the most surprising things in literary biography is the fact that, although one writer quite truthfully says of Shakespeare "We know little more of him than we do of Homer"—and of Homer we know practically nothing, not even his birthplace—a whole library of books has been written about the man William Shakespeare. It would really seem that the fewer facts we have about the life of any great man

of the past, the more books are likely to be written in attempting to tell the story of his life. The chief difficulty with Shakespeare is to conceive a man of such great genius as his works disclose who yet lived a very ordinary sort of life, for what little we do know of England's greatest poet scarcely bears out the imaginary picture of the man we are apt to draw in reading his plays.

In the little town of Stratford-on-Avon, still one of the most beautiful in the green Midlands of England, William Shakespeare was born on April 23, 1564. His father, although he had many ups and downs in his life, and seems to have been a jack-of-all-trades, cannot exactly be said to have been "in humble circumstances," as he cut something of a figure in the town, and was for a time its mayor. For all that, he was not a successful man, and the time came when his son William had to lend him money to help him out of difficulties. His father could not write his own name, and for all the writing which he himself did in later life, the only examples of his signature which have been preserved might be thought to indicate that even William wrote his own name with difficulty!

### A DAY AT SCHOOL IN STRATFORD-ON-AVON WITH THE BOY SHAKESPEARE

The boyhood of Shakespeare would, in all probability, be passed like that of any other tradesman's son of the time, with the healthy sports of a rural town for pastime, and the local grammar school as his home of learning. He had an excellent teacher at the grammar school, Master Walter Roche, who received the handsome salary of £20 a year—but in those days a shilling was of as much value as a pound is to-day—for acting as headmaster. William would have to be up betimes to take his place in the old grammar school, which is still standing, though considerably altered, for lessons began at six o'clock in the morning in the summer weather, as daylight was precious in those days, when such wonders as gas and electric light were still undreamt. But he would not have far to go

with his satchel

And shining morning face, creeping like snail

Unwillingly to school,  
as it was less than ten minutes' easy walk from his father's house in Henley Street to the local grammar school.

It is more than likely that this same young William Shakespeare was dressed just like the other lads of the town in a long and loose cloak hanging nearly to his ankles with short wide sleeves through which his arms were thrust. But his cloak would not altogether hide the more picturesque part of his attire consisting of a short well fitting jerkin his puffed hose sticking out from beneath the wrist to the thighs above his long dark coloured stockings. His shoes would be strange affairs that bulged somewhat at the toes being tied with long ends of their own material and the satchel wherein he carried his books would be the only thing about him that a schoolboy of our time might wear without attracting the attention of every passer by.

As for the boy himself we know him for a bright faced lad with high forehead and dark abundant hair his eyes of a light hazel colour full of mischief and healthy merriment. Whether he was a diligent scholar the pride of Master Roche or something of a trial to that worthy teacher we do not know but the poems he wrote in after life are so full of varied learning that we cannot but suppose the headmaster who was famous for his teaching of Latin found young Will Shakespeare one of his brightest and ripest pupils.

#### WHAT SHAKESPEARE WAS TAUGHT AT STRATFORD GRAMMAR SCHOOL

If a schoolboy of to day were to read the lessons in natural history which Shakespeare and his fellow scholars were taught he would have good cause for laughter. The blood of an elephant is the coldest blood in the world and dragons in the scorching heat of summer cannot get anything to cool them but this blood. That is a startling statement from a natural history of his time and will show how little Shakespeare could have known of the ways of wild life outside of his native woodlands where as a young man it is said he went hunting the deer and was once haled before a magistrate as a poacher.

The crabbed and crooked style of writing which was known as "old English" was the style taught by Master Roche who was rather behind the times as even then in London and the universities students were learning that open flowing script known

as Italian such as we write to day. If we knew nothing else about Shakespeare his signature would prove that he had been educated in a provincial town. But whatever the defects of the course of education at the Stratford Grammar School may have been William Shakespeare learned enough there to enable him to express with all the power of his wonderful genius the great and beautiful thoughts that later blossomed in his mind. He received during his six years at the school the key with which he was later on to unlock the treasure house of his imagination for all the world and for all time.

#### THE YOUTH OF THE POET AND WHAT HE DID AFTER HIS SCHOOLDAYS

Of Shakespeare's youth we know as little as we do about his schooldays. He would be fourteen years of age when his father's fortunes had sunk so low that in all likelihood John Shakespeare could not allow his son to continue longer at school and would have him withdrawn that he might earn something to help in keeping the home. To what employment the young man turned his hand we do not know for certain. It has been said that he was engaged as a butcher's boy perhaps in his father's shop. It has also been said that he became a lawyer's clerk the remarkable knowledge of the law which he displays in his writings being quoted as evidence in support of this though it is no good reason for supposing he was ever so engaged. What we do know for certain is that he was none too wise a youth for he was not quite nineteen when he married Anne Hathaway the daughter of a well-to-do farmer near Stratford. His wife was eight years older than he and we cannot suppose that his unfortunate father was happy at his headstrong son taking upon himself the responsibilities of married life when his help was so needed at home.

#### YOUNG SHAKESPEARE GOES UP TO LONDON TO MAKE HIS FORTUNE

Three or four years after his marriage and when he was the father of three children Shakespeare went to London to seek his fortune. How he lived in London during his early years there we do not know but the story that he was glad to hang about the theatre to earn a little money by playing gentlemen's ladies may be as true as







# SHAKESPEARE IN TROUBLE & IN TRIUMPH



This picture by Thomas Brooks illustrates a well known story of Shakespeare's youth. The poet is said to have been arrested for illegally hunting deer in the forest at Stratford and brought before them at first but Thomas Lucy. It is quite possible that the story is true and certainly in the early years Shakespeare made a play in one of his plays of this same Sir Thomas which seems to show he had some old score against him.



This picture by Edwin Rinder depicts Shakespeare as he was at the height of his fame in London reciting his great tragedy of "Macbeth" before Queen Elizabeth and a group of her courtiers. Although we have no knowledge that such an event ever took place it is certainly a pleasant picture to contemplate the greatness of our poet and a entertaining the greatest of our queens. In that wonderful age when the British Empire came into being.



These were the Puritans who in the lifetime of the younger Milton were destined to carry out a great revolution in England. Although the father of the poet belonged to those strict religionists, he was a man of literary and musical tastes. His qualities were inherited by his son and the seed of poetry which young Milton had received from his old Puritan father blossomed in time into one of the finest flowers of the world's literature.

The boy Milton would be about twelve years of age when he was entered as a scholar at St Paul's School, his education before that time having been received at home from a Scots tutor.

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OLIVER CROMWELL AND HIS FAMILY LISTENING TO MILTON PLAYING THE ORGAN

Great was the boy's love of books for not even his weak eyes and the headaches which resulted from his close studies prevented him even at this early age from poring over his well-loved books beyond the midnight hour. A day was to come when the strain thus placed upon his sight was to leave him blind. But even then he had the consolation of knowing that he had used his eyes to some purpose by storing his mind with the richest knowledge of his age. For even as a schoolboy he had learned his Latin and Greek so well that he could write in both these classic languages in prose and verse and of Hebrew also he knew something. Among his earliest efforts in verse writing were transla-

When I was yet a child no child I play  
To me was playing all my mind was set  
Serious to learn and know and thence to do  
What might be public good myself I  
thought  
Born to that end born to promote all truth  
All righteous things

Sometimes the great man does not seem to know himself as great but we have seen that Shakespeare was just as confident of the immortality of his poetry as Milton of his high destiny to which he felt himself called. And the study of his life also leaves us with the impression of a calm and self-reliant spirit that was a stranger to late musing, wretched but contentedly onward to the work that was desired for him. He had been fully seven years



of his life," says the dramatist Nicholas Rowe, who edited an edition of Shakespeare's works in 1709, "was spent as all men of sense wish thens may be, in ease, retirement, and the conversation of his friends." He saw both his daughters married, his only son having died in his twelfth year, and he went about among his townsmen just like an ordinary country gentleman. It is pleasant to contemplate this aspect of our greatest poet. The time had not yet come when men made a profession of literary work, and pretended to be a class apart from the general community.

Shakespeare wrote his great plays only to supply his fellow-actors with something to perform and they were immortal works because their writers had immortal gifts of mind which were fated thus to be conveyed to mankind at large. He went to no university to equip himself for the task, for no training of professors or tutors could have breathed into him one little spark of the divine genius inborn in the man, which was bound to shape itself somehow.

#### THE LAST DAYS OF ENGLAND'S GREATEST POET, AND HOW HE DIED

Shakespeare came at the right time, when interest in the stage as a medium of poetic entertainment and instinctive had revived, and his native powers were so much greater than those of all the scholars of his day that even in an age when learning and scholarship were dearly prized, and he had less in a scholastic sense, than many of his fellow-dramatists, he outshone, and will outlast, them all. In every sentence of his plays and poems we can see the easy, confident hand of a mighty master, and we know that he himself was conscious of his greatness, for he writes in one of his beautiful sonnets

Not marble, nor the gilded monuments  
Of princes, shall outlive this powerful rhyme.

In March, 1616 the poet was taken with illness, which is said to have been the result of a merry meeting with his friends Michael Drayton and Ben Jonson, who had visited him at Stratford, and on his birthday, April 23, 1616, William Shakespeare died in his fine house at Stratford. He was laid to rest in the chancel of the parish church where over his grave these words are carved upon a flat stone:

Good friend, for Jesus' sake forbear  
To dig the dust enclosed here  
Blest be the man who spares these stones  
And curst be he who moves my bones.

We know not who wrote these lines, but no one has ever ventured to break this solemn command, and there the dust of England's greatest poet still reposes.

#### THE BIRTH OF JOHN MILTON AT THE SIGN OF THE SPREAD EAGLE IN LONDON

When Shakespeare died at Stratford there was an eight-year-old boy in the City of London who was destined to be not only the next great poet to Shakespeare in point of time, but, after Shakespeare, the greatest of all English poets. His name was John Milton, and he was born in Bread Street, off Cheapside, on December 9, 1608. In those days it was the custom of tradespeople and others to hang a sign at their door, exhibiting some device by which their place could be easily recognised. This old-fashioned custom is still observed to-day, though chiefly, we fear, by publicans. Among the many signs that decorated Bread Street three hundred years ago was one of a spread eagle. At the house so marked lived John Milton senior with his family and there he carried on the profession of a scrivener. This work was in some respect like that now discharged by solicitors, such as drawing out wills and preparing other legal documents; and scriveners were also lenders of money.

This John Milton senior must have been of strong, independent character, for he had brooked the displeasure of his father by renouncing the Catholic religion, which had been the faith of his family, and adopting Protestantism.

#### THE GREAT STRUGGLE THAT WAS BEGINNING WHEN MILTON WAS BORN

He was thus one of the Puritans, as they were called, for these were the days when a great struggle was duly beginning between two different types of the English mind. Although the country was supposed to be Protestant, and the king a Protestant also, many people were at work to shake the religion of the land, and while these would have permitted much that was loose and lax, there grew up against them others who, going to the opposite extreme, took the letter of the Bible rather than its spirit as their guidance, and became noted for their strict observance of religious duties.

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# TWO SCENES IN THE LIFE OF JOHN MILTON



Milton was the great thinker in the days of the Commonwealth, when Oliver Cromwell ruled England with a firm hand. Both men had imperious natures, but the poet in those days could not have been led by his poetry and he was employed by the Government and the Church to write poems to glorify the new regime. While employed by the Government, Milton had to argue in his work. His colleague was a famous poet and a man of bright character, Andrew Marvell by name. In this picture by G. H. B. Gilbert, R.A., we see Marvell talking to the blind poet.



At Milton was blind during the last twenty years of his life and in those years composed some of his greatest poems including Paradise Lost and Samson Agonistes. His daughters had to be his eyes and write down the words he dictated them. In the above picture by M. G. B. we see his daughter, Anne, writing down the words he dictated them. For they grew tired of the labouring work which their father's blindness required of them and in the later years of his life they behaved in a very bad way. Milton was much of the same as the great poet.

at Cambridge when he quitted the University with the degree of M A, and went to his father's country house at Horton, in Buckinghamshire, where five more years of his life rolled on in the study of books and Nature and the writing of many poems which rank among the finest in the world

# MILTON RETURNS TO LONDON ON THE EVE OF THE CIVIL WAR

His mother's failing health had kept him at home but when she died he was free for a time to set out on his travels and to see for himself those wondrous towns and countries of the Continent whose stories and literature he knew so well. So for some fifteen months he wandered among the stoned towns of Italy and France, and the influence of the classic scenes of Italy did much to shape his thoughts towards the later poetical achievements of his life.

When he returned to London in 1639 the struggle between the people and the king, which three years later resulted in the Civil War, had become so serious that the whole country was unsettled. But Milton was essentially a man of peace, and instead of taking part in this great agitation, except by writing a series of bitter attacks upon the bishops, who were in league with the king, he devoted himself to the quiet task of teaching, and had a sort of boarding-school for a number of years in Aldersgate Street. But the bitterness of the struggle which was going on in these unhappy days entered into the poet's life in a strange way.

He married a lady who came of a Royalist family and had all the gay and flippant notions of the Cavalier class, who were the opponents of the Puritans.

# MILTON MARRIES A ROYALIST LADY BUT IS STAUNCH TO THE PURITAN CAUSE

As Milton was, in his ways of life, the most grave and frugal of Puritans, it was not likely that his young wife could immediately find happiness with him, and after a few weeks she returned to her father, but two years later, when the fortunes of war had gone against the Royalists and their supporters, and Mary Milton had learned that life is something more than dancing and merry parties she returned to her husband, and even her father was glad to have the shelter of the Puritan poet's roof.

Milton, in the meanwhile, had been writing not poetry but prose, and his finest work of this period was entitled "Areopagitica." That is a Greek word for an oration addressed to the Greek Parliament, which was known as the "Areopagus," and Milton gave this title to his work because it was addressed to the Parliament of his own country. The "Areopagitica" is a noble plea for the liberty of thought and especially the right to publish in print one's honest opinions, and is regarded as one of the finest examples of English prose writing. Another prose work of Milton's, in which he defended the execution of Charles I, had an important bearing on his life, for it was esteemed so highly by the Puritan Government that Milton was appointed Latin Secretary to the Council at a handsome salary, his work being to draft the correspondence of the Government with foreign Powers, then carried on in the Latin language.

# THE SAD, SIGHTLESS DAYS OF THE CLOSE OF MILTON'S LIFE

A new period of the poet's life now began. Eminent in the public life of his day, his great literary powers were employed, not in the mere translating of State correspondence, but in defending the Puritan Government against its critics on the Continent. It is the least pleasant picture of his career to look upon, for we feel that Milton was far too great a man to expend his powers in this direction. In 1653 he was left a widower with three young daughters to look after, but the greatest trial of his life befell him about the same time.

His eyes, which had been weak from boyhood, now failed him completely, and by the year 1654 the poet was blind. Still he bravely faced his work as Latin Secretary, first with an assistant, and afterwards with the aid of a colleague, Andrew Marvell, who was himself a poet of great power, and a man of fine character. For the sake of his motherless children he married again, but his second wife died some fifteen months after the wedding, so that Milton's daughters, at the most critical time of their lives, were left without a mother's guidance, and in later years were somewhat of a trial to their sightless father.

But if the eyes of his body no longer saw the beautiful things of earth, the

# The Child's Story of THE EARTH

## WHAT THIS STORY TELLS US

WE have discussed the earth as a whole and from many special points of view and we have tried to dive down as deeply as possible—though that is not nearly deep enough—in order to find far under our feet, the explanation for things that show upon the surface. But, before leaving this part of our subject, we must devote our attention to one particular part of the earth's surface which is indeed the most important of all—the soil upon which living creatures depend for their food. We are all rooted in the soil and without the soil not one of us could be alive. It is an absolute condition of the existence of thinking moral beings like ourselves that the very outside of the earth's crust shall be changed into this stuff we call the soil.

## THE SOIL AND ITS USES

THE more we know about our world the more clearly does it look as if life were its great purpose. We are to think of the planet as a theatre an arena a mother for life and we have already seen that it is the life of the land which breathes air that reaches the highest. Now when we examine into this life we find that it all depends upon what happens at the very surface of the solid earth where earth and air meet. We find further that the outer few inches of the earth's crust or it may in some cases be a very few feet become changed by the influence of air and water and light and life into some thing which we call soil.

We speak of soiling a thing because the soil is rather messy as if the soil were rather beneath our notice. But we know that animal life absolutely depends upon vegetable life for its existence and we find that vegetable life depends upon the soil for its existence. So we may say that really everything that makes the existence of a planet worth while that is to say all the higher life which it now has depends upon the processes which are classed as going on just at the very outside of the earth's crust.

When we are in the country or at the seaside we can see for ourselves what the soil means because we can notice for instance at the top of a chalk cliff or a rock cliff a narrow layer which is evidently different from the rest. That layer is the soil. We may see it at the top of the chalk cliff on the south coast of England



and if we study it there we must understand that we are

studying what goes on every where throughout the dry land of the earth except in deserts or where there is eternal snow and ice and upon this process

which we can study so easily for ourselves up to a point is dependent the whole life of man.

If we look at the chalk cliff from the beach we see that a few inches at the very surface instead of being white are brown the chalk has been changed into soil by the process called

weathering. The brown colour is due to iron which as we know is a necessary condition of all life every where. Often the rain trickling down the side of the rock will carry a little of the iron with it and so we may see little brown streaks staining the white surface of the cliff. Upon the surface of these few inches of altered cliff green vegetable life grows. Even since we began to study the story of the earth a great many interesting and important facts have been made known about the soil and we are fortunate in being able to learn them now.

We know that every living creature requires nitrogen as part of its food we know also that about four fifths of the atmosphere consists of nitrogen and so the surface of the soil and anything growing there are exposed to this gas. Also we can readily understand that as the soil is rather loose there is a good deal of air in it and this soil-air as it is called also consists mostly of nitrogen.

eyes of his soul had now far finer visions of the unseen world, and in his leisure time he was engaged upon the composition of his grandest work, the great poem of "Paradise Lost." Meanwhile troubles of another kind were gathering round his devoted head.

#### CROMWELL, THE MAN OF THE SWORD, AND MILTON, THE MAN OF THE PEN

While Oliver Cromwell had ruled with his firm hand, Milton was also a power in England. Cromwell was the embodiment of the vigour and force of his England, Milton the great thinker of the Commonwealth. For years they had worked together, the one doing, the other advising. So that when Cromwell died, and his weak son Richard succeeded him, only to let the country go over to the son of the slain King Charles, Milton, having written so much against the Stuart kings, had for a time to hide himself in the days of vengeance which marked the beginning of the Restoration. It says something for the friends of Charles II. that the great poet suffered no personal punishment for his writings against Royalty.

There is no period of the great poet's life one would rather dwell upon than those days when he was supposed to have sunk into obscurity, but was really making his name immortal, raising for himself a monument of fame that will outlast all others of his age. Deprived of his public office, and living in a humble house, though still above poverty, the poet's days were spent in dictating the majestic lines of "Paradise Lost."

#### HOW MILTON GOT TEN POUNDS FOR THE GREATEST POEM OF MODERN TIMES

It was during the Great Plague of 1665 that he removed with his daughters to a cottage at Chalfont, in Buckinghamshire, which he owed to the kindness of a friend, where the greatest work of his poetic genius was finished. In 1666, the year of the Great Fire, Milton got a London bookseller to print "Paradise Lost" and received in all £10 when 1,300 copies of it had been sold.

He had still many admiring readers, though he received so little for his writings, but amid the gaieties of the Cavaliers, who now ruled England under Charles, she who Milton's splendid poem even her father expected to touch the shelter of the whole country as it would appear in the sober

days when Cromwell ruled, and the poet was admired as the greatest thinker in the land. "Paradise Lost" is the noblest poem in the English language, and one of the grandest works of the modern world. It is founded on the Bible story of Adam and Eve, and how they came to be driven from the Garden of Eden. No description that can be given here could convey to the young reader any idea of the majestic grandeur of the poet's awestruck pictures, the stately beauty of his verse, the dramatic fire and colour of certain scenes, the gentle pastoral beauty of others. It is one of the great treasures of our literature, which we all must read, and rejoice in the knowledge that its author was an Englishman.

The next work of Milton's, after his great poem was a "History of Britain," appearing in 1670, and in the year after that he published two more poems.

#### THE LAST WORKS OF MILTON AND THE END OF HIS DAYS

"Paradise Regained" is a much shorter and not so fine a work as his great poem, though its subject is the more inspiring one of our Saviour triumphing over the temptation of Satan. "Samson Agonistes," the title of the other, is from the Greek, and it is not easy to give it in English, but we might translate its meaning as "Samson the Contestant." It is a short dramatic poem, describing the last days and deeds of the mighty Samson, who, deprived of his sight, could yet exert his giant strength to the destruction of the Philistine temple. It is really an expression of his own life and thought in his closing years, for the poet himself was something of a Samson all his life, and, not less after blindness had smitten him, was devoted to pulling down the temples of the false gods, his poetry being unmatched as a plea for righteousness, apart from the great soul-stirring books of the Bible.

The closing years of Milton's life were spent in the simplest fashion, and he had the companionship and devotion of his third wife, Elizabeth Minshull, whom he had married in 1663, to make up for the desertion of his undutiful daughters. He died on November 8, 1674, and was buried in the church of St. Giles, Cripplegate, London.

The next Men and Women begin on 3483

It was next found that these swellings are filled with microbes of a special kind. A sort of partnership sprung up between the leguminous plant and the microbe and this is only one instance of several that we know in which two different kinds of living things make an arrangement of this kind between themselves. The pea or bean or whatever it is supplies the microbes with sugar and starch which microbes not being green cannot make for themselves but which they find very useful. On the other hand the microbes have the extraordinary power which no green plant has of fixing the nitrogen of the air—that is to say combining it with other elements. The compounds of nitrogen thus formed are handed over to the leguminous plant which thus gets on just as well as if a rich supply of nitrates were being poured into the soil. So it was proved that microbes could fix nitrogen but all attempts to make these microbes do the same for other kinds of plants as for instance for wheat failed completely. The arrangement will only work between these microbes and leguminous plants.

#### THE ENERGY THAT THE MICROBE GIVES TO THE PLANT

Plainly there was much more to be discovered and that has now been done. The probability was that as there were microbes which could fix the nitrogen of the air we should find other microbes perhaps living free in the soil which could also fix nitrogen and could thus supply compounds of nitrogen for the life of green plants in general trees and grasses including cereal.

Now here is a very important point which we must understand here. When we take nitrogen and combine it with anything power or energy is stored up as we say in other words there is more energy in the compound of nitrogen than there is in nitrogen itself. This energy is of course wanted and used by the green plant. But nothing comes from nothing. If we make compounds of nitrogen in the chemical laboratory we know that according to the quantity we make so we must spend a certain quantity of electricity or heat just as when compounds are naturally made in the air by electricity. Now though life is a miracle and a divine miracle it is not

can neither create nor destroy energy. It is a transformer but not a creator. If a microbe makes a compound of nitrogen it has to get from somewhere the power to do so just as the chemist must when he does the same thing.

#### HOW THE MICROBES FEED THE PLANTS WITH NITROGEN COMPOUNDS

This means indeed that if the microbe is to make compounds of nitrogen it must be supplied in its food with power which it can put into them. In the case of the microbes that live on the roots of leguminous plants the power comes from those plants—that is part of the bargain between them and it comes mainly in the form of things like sugar and starch. These things contain power for they make us strong and when they are supplied to the microbe it puts the power of them into the compound of nitrogen which it makes.

Put now this is very serious for the green plant requires nitrates but the microbe requires the help of the green plant before it can make the nitrates. The first question we must ask is: Where does the energy come from in the first place? There is no difficulty about the answer. The energy comes from the sun. It is the power of sunlight that is stored up in the sugar made by the plant. It is that power which the microbe takes and puts into the nitrates it makes. Now in certain parts of the world we find soils which contain a very huge quantity of nitrates. In Russia in Manitoba and in the Argentine we find these rich soils which are of course the joy of the farmer and which grow the most magnificent wheat. Huge weights of nitrates are contained in every acre of these soils and the soil is full thick.

#### HOW THE POWER OF ALL FROM THE SUN COMES FIRST OF ALL FROM THE SUN

We are certain that these nitrogen compounds have been made by microbes not the same as those which live on the roots of leguminous plants but others. But the law that all power must be accounted for has to be reckoned with. Where has the power come from which the microbes have used? It has come from the only means of the earth plant. The whole meaning and explanation of this is that for a long time past natural vegetation has been growing



So we should suppose that an ordinary green plant of any kind gets the nitrogen that it always needs, from the air in which it is bathed. We know that the green plant feeds upon the carbonic acid in the air, and we might suppose that, as it must have nitrogen, it feeds upon the nitrogen too.

#### THE NITROGEN WITHOUT WHICH ANIMALS AND PLANTS CANNOT LIVE

Now, we ourselves, and the lower animals, require nitrogen, but it is found that, though it passes into our blood from the air, we do not use it, and anyone who does not get proteins, which contain nitrogen, in his food, will die of lack of nitrogen, even though his blood contains quantities of it. The reason is that he cannot use nitrogen except when it is combined with other things. Now a very striking and unexpected fact was discovered about green plants several years ago; they are exactly like us in this respect. Carbonic acid gas they can feed upon, though we cannot, but neither they nor we can use the nitrogen gas of the air. This was proved by some Englishmen about fifty years ago. But it is perfectly certain that the plant must get nitrogen, and everyone who has to do with plants knows that they must be supplied in the soil with compounds of nitrogen. The interesting question is, How are these compounds obtained?

We know that when there is a flash of lightning or indeed, whenever there are electrical disturbances of any kind in the air, a certain amount of the nitrogen and oxygen of the air combines and the compounds thus formed are largely carried down into the soil by the rain. So here is, at any rate, one source of combined nitrogen for the use of vegetable life, and it is a source which is in more or less constant action.

#### THE GREAT MYSTERY OF THE NITROGEN THAT IS FOUND IN THE SOIL

But everyone who grows plants knows well that for practical purposes this source cannot be counted upon at all. If he trusts to it alone, and there are no compounds of nitrogen in the soil to start with, his plants will not grow at all and this, of course, is true of all the crops upon which mankind lives. Or, rather, to be exact, we should say that the plant grows until it has used up the compounds of nitrogen contained

in the seed from which it started. When that is done, the plant simply stops growing. So, plainly, there must be some other source of compounds of nitrogen besides what the rain washes down into the soil from the air.

We know this, also, because in some parts of the world there are enormous quantities of compounds of nitrogen in the soil—quantities which cannot possibly be accounted for in this way. *Something else* happens in the soil, by means of which the free nitrogen of the air is made to combine with other elements, and so turned into compounds of nitrogen upon which the green plant can live. We say that the nitrogen is somehow "fixed," and this question of the fixation of the atmospheric nitrogen is one in which all the students of the soil are now deeply interested, and some wonderful things have been discovered.

#### HOW THE MICROBE AND THE PLANT GO INTO PARTNERSHIP

There is a certain kind of plants which has long been known to have a special power of growing and thriving even without a supply of those compounds of nitrogen which other plants need. The proper name for these is *leguminous* plants. They are so called because they form a thing called a legume, and we may know what that is because a pea-pod is a legume. Now, we find that the plants that produce pods like that—peas, beans, clovers, and vetches—behave as if they had the power of feeding on the nitrogen of the air. When we examine crops of this kind, we find that they contain far more nitrogen than can be accounted for unless the air has been drawn upon.

The men who began to study these plants found that they have tiny little swellings at various places on their roots, and that if they have not these swellings, they behave just like other plants, and cannot use the nitrogen of the air. Further, these swellings are only found on the roots of plants which have been infected by a little soil. If the plants are grown in sand, and no soil is allowed to get near them, no swellings appear on their roots, and they cannot grow unless compounds of nitrogen are supplied to them. There is, then, something in the soil which makes these swellings and which gives the plant the power of using the nitrogen of the air.

It was next found that these swellings are filled with microbes of a special kind. A sort of partnership spring up between the leguminous plant and the microbe and this is only one instance of several that we know in which two different kinds of living things make an arrangement of this kind between themselves. The pea or bean or whatever it is supplies the microbes with sugar and starch which microbes not being green cannot make for themselves but which they find very useful. On the other hand the microbes have the extraordinary power which no green plant has of fixing the nitrogen of the air—that is to say combining it with other elements. The compound of nitrogen thus formed are handed over to the leguminous plant which thus gets on just as well as if a rich supply of nitrates were being poured into the soil. So it was proved that microbes could fix nitrogen but all attempts to make these microbes do the same for other kinds of plants as for instance for wheat failed completely. The arrangement will only work between these microbes and leguminous plants.

#### THE ENERGY THAT THE MICROBES GIVES TO THE PLANT

Plainly there was much more to be discovered and that has now been done. The probability was that as there were microbes which could fix the nitrogen of the air we should find other microbes perhaps living free in the soil which could also fix nitrogen and could thus supply compounds of nitrogen for the life of green plants in general trees and grasses including cereal.

Now there is a very important point which we must understand here. When we take nitrogen and combine it with anything power or energy is stored up as we say in other words there is more energy in the compound of nitrogen than there is in nitrogen itself. This energy is of course wanted and used by the green plant. But nothing comes from nothing. If we make compounds of nitrogen in the chemical laboratory we know that according to the quantity we make so we must spend a certain quantity of electricity or heat just as when compounds are naturally made in the air by electricity. Now though life is a miracle and a marvellous thing, it

can neither create nor destroy energy. It is a transformer but not a creator. If a microbe makes a compound of nitrogen it has to get from somewhere the power to do so just as the chemist must when he does the same thing.

#### HOW THE MICROBES FEED THE PLANTS WITH NITROGEN COMPOUNDS

This means indeed that if the microbe is to make compounds of nitrogen it must be supplied in its food with power which it can put into them. In the case of the microbes that live on the roots of leguminous plants the power comes from the green plants that is part of the bargain between them and it comes mainly in the form of things like sugar and starch. These things contain power for they make us strong and when they are supplied to the microbe it puts the power of them into the compounds of nitrogen which it makes.

But now this is very curious for the green plant requires nitrates but the microbe requires the help of the green plant before it can make the nitrates. The first question we must ask is: Where does the energy come from in the first place? There is no difficulty about the answer. The energy comes from the sun. It is the power of sun light that is stored up in the sugar made by the plant. It is that power which the microbe takes and puts into the nitrates it makes. Now in certain parts of the world we find soils which contain a very huge quantity of nitrates. In Russia in Manitoba and in the Argentine we find these rich soils, which are of course the joy of the farmer and which grow the most magnificent wheat. Huge weights of nitrates are contained in every acre of these soils and the soil is feet thick.

#### HOW THE POWER OF THE MICROBES COMES FIRST OF ALL FROM THE SUN

We are certain that the nitrogen compounds have been made by microbes not the same as those which live on the roots of leguminous plants but others. But the law that all power must be accounted for has to be reckoned with. Where has the power come from which the microbes have used? It has come from the sun by means of the green plant. The whole manner and explanation of these wonderful soils is that for a long time past natural vegetation has been growing

upon them catching the power from the sun and turning it into soft leaves which fall into the soil, and feed the microbes and so enable them to fix the nitrogen of the air. At Rothamsted in Hertfordshire where men are teaching the world some of these great facts about the soil, they have carefully compared the soil on two pieces of land, side by side.

### HOW THE EARTH SAVES UP THE RICHES OF THE SUN

One of these has been cultivated in the usual way, and each year the crops, whatever they were, have been taken away by man and used. The other piece of land has been purposely left absolutely alone for a period of twenty-five years, it has been allowed to run wild, and it is now a bit of prairie land. The soil was carefully examined twenty-five years ago and the amount of nitrates it contained was known. It is now found that the piece of land which has been cultivated contains no more nitrates than it did and that the piece which has run wild has been collecting huge quantities of nitrates. Year after year the green plant has been growing. Its starch and sugar, instead of being carried away by the harvest-maker, have fallen back to the soil, and have fed the microbes which fix nitrogen.

We have quite lately discovered this very microbe, which is probably more important than all others in the world. It has rather a long name—*azotobacter*. This really means the bacterium or microbe that has to do with azote, and that is an old name for nitrogen. At Rothamsted they have lately examined soils from every part of the world, from Siberia, Australia, Canada, and so on, and everywhere, without exception, this microbe is found in the soil. It is a rather large, round microbe, but there is nothing about its appearance to tell us what its power is. If we could see into the heart of its life, we should find it to be a marvellous transformer of power.

### A WONDERFUL MICROBE THAT IS LIKE A FURNACE AND BURNS UP SUGAR

It is like a furnace. It will burn up sugar and starch at a tremendous rate, and as it burns them up, it makes compounds of nitrogen. All over the world the growth of the green plant, upon which our lives depend, depends upon the exquisite balance of duty that obtains between the green

plant, which can feed upon the carbonic acid of the air but not on the nitrogen and this microbe, which can feed on the nitrogen, if the green plant will supply it with the products of its feeding. Indeed, what it means is this: that the astonishing discovery made about leguminous plants really applies to all green plants. The leguminous plants have a special arrangement of their own and the special microbes with which they are in partnership actually live inside their roots. But what is true of them is true in essentials of plants in general, though the *azotobacter* and its relatives find it equally convenient to live free in the soil instead of housing themselves in the green plant's roots.

It is a necessary condition for the existence of the *azotobacter* that the soil be not acid. Here and there we can find soils which have turned acid because something or other has made or put acid substances into them. In such soils the *azotobacter* cannot live, and, as a consequence, we find that these soils are infertile. Sometimes we are ourselves to blame for this, for we add to the soil various substances meant to do it good, which, nevertheless, are got hold of by microbes, and turned into acids.

### THE MILLIONS OF USEFUL MICROBES THAT LIVE IN THE SOIL

Instead of doing the soil good by this treatment, we destroy the *azotobacter*, and then things will not grow in it. We are now beginning to get an idea of the complicated character of the soil. Words cannot describe how crowded it is with microbes of all kinds. The surface of the soil is always receiving additions of matter from previous life, leaves, and stalks, and so on. Then there are animal remains, and so on, added to it, not to mention the manures which are added to it on purpose. All these things, as they pass into the soil, are rapidly changed, and it is very easy to prove that these changes are all due to microbes. If we take some soil, and heat it so as to kill the microbes in it, all these changes stop, or if we add to the soil something which kills microbes, such as chloroform, then also these changes stop. That, of course, is the last thing that we wish to happen, but most of these changes which go on in the soil serve to prepare the food for the green plant. As we already know, the

very leaves which it sheds in the autumn are turned into new food for it in the spring if the microbes are allowed to do their work.

Now the ordinary chemistry of the soil is of course very important. We have already seen how tremendously important is the difference between an acid and an alkaline soil, and so it is very important that we shall add to the soil in certain cases certain chemical substances such as nitrates and carbonates and salts of ammonia. Often however we may do more harm than good if what we add upsets the balance of power amongst the microbes in the soil, and we are more and more learning that it is really the living microbes and not the lifeless chemicals that decide what the result shall be. And so the question arises whether our new knowledge of the soil may not help us to feed it with microbes of the kind we want and so to get even more success than by feeding it with any chemicals at all.

#### LAZY MICROBES THAT WOULD NOT WORK FOR THEIR LIVING

Students of the subject began by getting hold of the microbes which they found on the roots of leguminous plants. They managed to grow them by themselves just as the microbes of consumption and so forth can be grown. And then they thought to apply these growths to the soil. They failed at first because the microbes having been too well fed in the laboratory had turned lazy and simply would not work when they were put back into the soil. This is just one more instance of the universal truth which applies to every living thing and every part of it. Instead of having to work for their living the microbes had been fed in little glass tubes with all sorts of nice things, which no doubt made them feel very fat and plump and comfortable but made them useless like all persons who are over fed without having to work. However that difficulty was got over but even then it was found that either one kind or another of desirable microbes is already present everywhere in the soil.

A great many people believe that this feeding of the soil with living microbes is very useful but on the other hand many other people are not yet sure that this is really being proved. Time will show and at any rate there is little

doubt that if we cannot yet do what we desire we shall be able to do so soon. Now there is a most important matter which we must insist on. When we use up coal or so called mineral oil we are really using up the great capital of wealth which has been accumulated—aved up from the sunlight of past ages by the plants which were then alive.

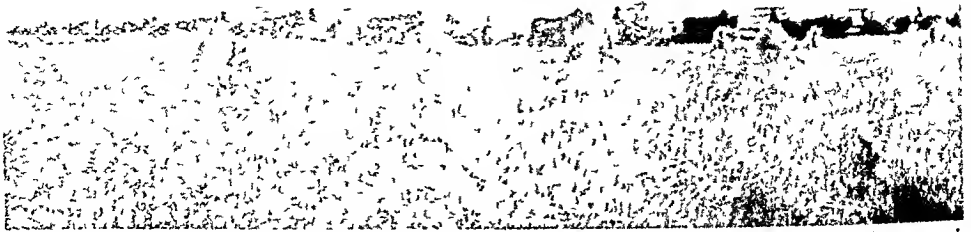
#### HOW THE SUNSHINE OF THE PAST FEEDS THE COW LANDS OF TO DAY

And now we learn that in the new countries where we are growing crops to feed our ever increasing millions mankind is also living upon its capital. It is true that in the great wheat lands of Manitoba for instance the capital may be enormous but it is not endless. The green fields of corn which cover such a great part of the earth to day are of course using the sunlight of the present. We know that they could not grow without that. But if that were all they had to draw upon they could not grow as they do. In the main they are living upon the sunlight of the past just as much as if we had to feed them upon coal as we have to feed machines which are not alive.

We have learnt that the wealth of the soil upon which these plants grow has gathered there and has been transformed by the azotobacter from the sugar and starch which past grain plants have made from the sunlight. The soils which are wealthy now are the soils which have saved before now like the soil of the land which was left alone for a quarter of a century at Rothamsted and which became rich because men did not come and take away from it the wealth it made from year to year. People are looking to science to help them in this matter that is if they think about it at all.

#### SOMETHING THAT NEITHER NATURE NOR SCIENCE CAN DO

They think that when the coal is exhausted or when the rich soils are exhausted science will supply something else. Now science can do wonderful things but it cannot make something out of nothing, for the very good reason that not even Nature can make something out of nothing. Science may learn how to use to its best all the sunlight that falls upon the earth at the present. But when we have used up the sunlight of the past as we are now doing that is



Magnificent harvests of rich wheat are reaped in lands like Manitoba, where for centuries the soil lay unused.

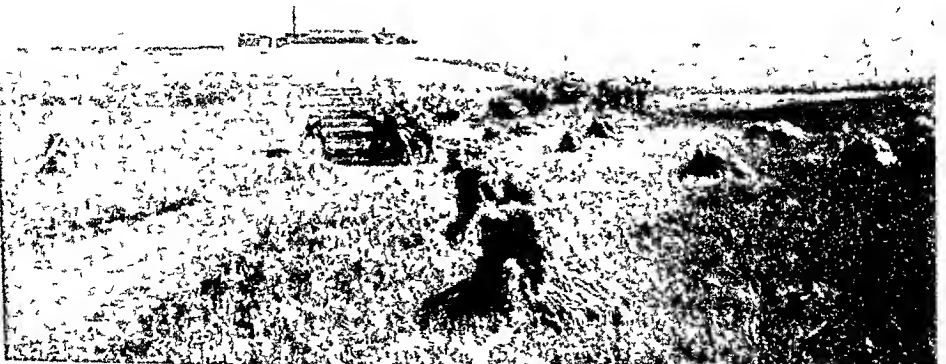
all mankind will have to live upon, for we cannot borrow the sunlight of the future. These are great questions which thoughtful people must begin to think about unless posterity is to turn upon us, and call our age the age of blind waste.

After this we must go on to another part of the STORY OF THE EARTH. We have already a good idea of what the earth is, and we have studied some of the other worlds in space in order to learn more about the world we live on. We have learnt also about the different kinds of elements that make up the earth, and the sun and the stars, and the way in which those elements combine with each other. If we are to use big words, then we can say that we have studied geology and astronomy and chemistry and geography—not the geography which deals with frontiers and cities, but natural geography, and, lastly, we have even

studied agriculture. There still remains a very important and very big study, the special name of which is physics—a name derived from the Greek word for Nature.

By physics we now mean the study of motion and heat, light, sound, and electricity. Of course, there is no real division between physics and chemistry, for instance, and we cannot understand the one without the other. Nature is not made in watertight compartments, though I am afraid we often talk and think as if she were, and as if our minds were. It is only for convenience, and because we cannot see everything at once, that we have to study one thing at a time. So next we shall go on to study motion, which is very much more interesting than perhaps we at present think.

The next part of this is on page 3465



The great harvests in Canada are due to unused nitrates that have for centuries been accumulating in the soil. The photographs on this page are reproduced by permission from "Canada."

# The Childs Book of POETRY

## A FAMOUS POEM BY MATTHEW ARNOLD

MATTHEW ARNOLD if not in the very first rank of English poets is still to be regarded as one of the greater of our modern writers. In his character he reminds us somewhat of Charles Kingsley as a lover of all that was manly pure and of good repute. He wrote many books but chiefly in the realm of criticism, on which his fame is largely founded although there are some who think his beautiful and inspiring poems will outlast his brilliant criticisms of literature and religion. The eldest son of Dr Arnold of Rugby one of England's most famous schoolmasters he was born on December 24 1822 and died on April 15 1888. Most of his active life was spent as an inspector of schools but for ten years he was also Professor of Poetry at Oxford. The poem we give here is one of his most delicate and fanciful pieces and although it is addressed to children it will charm and engage us long after our childhood days are past.

## THE FORSAKEN MERMAN

Come dear children let  
us away

Down and away below  
Now my brothers call  
from the bay

Now the great wind shoreward blow  
Now the salt tide seaward flow  
Now the wild white horses play  
Champ and chafe and toss in the bay  
Children dear let us away  
This way this way!

Call her once before you go

Call her once yet

In a voice that she will know

Margaret! Margaret!

Children's voices should be there  
(Call once more) to a mother's ear  
Children's voices wild with pain  
Surely she will come again  
Call her once and come away  
This way this way!

Mother dear we cannot stay

The wild white horses foam and fret

Margaret! Margaret!

Come dear children come away down

Call no more

One last look at the white walled town  
And the little grey church on the windy shore  
Then come down  
She will not come though you call all day  
Come away come away

Children dear was it yesterday

We heard the sweet bells over the bay?

In the caverns where we lay

Through the surf and through the swell

The far-off sound of a silver bell?

Sand strewn caverns cool and long

Where the wind is so all asleep

Where the speck lights quiver and gleam

Where the salt waves sway in the dream

Where the water ranged all around

Leed in the core of the sun and ground

Where the sea is so cool and twin

Doth it not all and back in the brine

Where great whales swim and great

Sail and sail with wind and wave

Remind the world for ever and aye?

Will not you be come this way?

Children dear was it yesterday?



Children dear was it  
yesterday

(Call yet once) that she  
went away?

Once he sat with you and me

On a red gold throne in the heart of the sea

And the youngest sail on her knee

She comb'd its bright hair an' it shone

it well [off bell]

When down swung the sound of the far

She sigh'd she looked up through the clear

green sea

She said I must go for my kin I'll pray

In the little grey church on the shore to-day

'Twill be Easter time in the world—ah me!

And I love my poor soul Merman her with

thee" [way]

I said Go up dear heart through the

Say thy prayer and come back in the kind

sea-cave

She smiled he went up through the surly

in the bay

Children dear was it yesterday?

Children dear were we long alone?

The sea grows stormy the little ones moan

Long prayers is it in the world they say

Come I said and we rose through the surf

in the bay

We went up the beach in the sand & down

Where the sea stocks bloom to the white

walled town [was still]

Through the narrow pass I said we rose

To the little grey church in the windy hill

I saw the church came a murmur of folk at

their prayers

But we stood well out in the cold bleak winged

We'd mired on the graves on the stones worn

with rain

And we gazed up the sea through the small

leaded panes

She sat by the pillar we saw her there

Margaret hush! Come back we are here

Fear I said I said we are here

The sea grows stormy the little ones moan

It is ah she came never a back

Where you were seated in the holy

Land prays the poor & starved folk

Come away they call in prayer

Come away come down call in prayer

Down down down,  
Down to the depths of the sea,  
He is at her side in the humming town,  
Singing most joyfully  
Hark what she sings—“O joy, O joy  
For the humming street and the child with  
its toy,  
For the priest, and the bul, and the holy cell,  
For the wheel where I spun,  
And the blessed light of the sun—  
And so she sings her fill,  
Singing most joyfully,  
Till the shining falls from her hand,  
And the whizzing wheel turns red—  
She steals to the window, and looks at the  
sand,

And over the sand at the sea,  
And her eye are set in a stare,  
And anon there breaks a sigh,  
And anon there drops a tear  
From sorrow-clouded eyes,  
And a heart sorrow-filled,  
A long, long sigh,  
For the cold, strange eyes of a little mermaid,  
And the gleam of her golden hair.

Come away, away children,  
Come children, come down,  
The hoarse wind blows colder,  
Lights shine in the town  
She will start from her slumber  
When gusts shake the door,  
She will hear the winds howling,  
Will hear the waves roar  
We shall see while above us  
The waves roar and whirl,  
A ceiling of amber,  
A pavement of pearl  
Singing “Here came a mortal,  
But faithless was she,  
And alone dwell for ever  
The kings of the sea”

But, children, at midnight,  
When soft the winds blow,  
When clear falls the moonlight,  
When spring-tides are low,  
When sweet airs come seaward  
From heaths starred with broom,  
And high rocks throw mildly  
On the blanched sands a gloom;  
Up the still glistening beaches,  
Up the creeks we will lie,  
Over banks of bright seaweed  
The ebb-tide leaves dry  
We will gaze from the sand-hills  
At the white, sleeping town,  
At the church on the hillside—  
And then come back down  
Singing “There dwells a loved one,  
But cruel is she,  
She left lonely for ever  
The kings of the sea”

### CHERRY RIPE

This little lyric in praise of “Julia’s smiling lips was written by Robert Herrick, who was born in 1591, and died in 1634

CHERRY ripe, ripe, ripe, I cry,  
Full and fair ones—come and buy,  
If so be you ask me where  
They do grow—I answer, There,  
Where my Julia’s lips do smile—  
There’s the land, or cherry-isle,  
Whose plantations fully show  
All the year where cherries grow.

### THE MILKMAID

Jefferie Taylor, the author of these homely verses, was a very old man, was a member of a family of whom several were noted writers for the young. “The Land and the Moon,” on page 112, was written by the same author.

A MILKMAID, who poised a full pail on her head,  
Thus mused on her prospects in life, it is said—  
“I let me see—I should think that this milk  
will procure

One hundred good eggs, or four-score, to be sure.

“Well, then—stop a bit—it must not be forgotten,

Some of these may be broken, and some may be rotten;

But if twenty for accident should be detached,  
It will leave me just sixty sound eggs to be hatched

“Well, sixty sound eggs—no, sound chickens,  
I mean

Of these some may die—we’ll suppose seven-  
teen

Seventeen! not so many—say ten at the most,  
Which will leave fifty chickens to boil or to roast

“But then there’s their barley, how much  
will they need?

Why, they take but one grain at a time when  
they feed—

So that’s a mere trifle, now then, let us see,  
At a fair market price, how much money  
there’ll be

“Six shillings a pair—five—four—three and-  
six

To prevent all mistakes, that low price I will  
fix

Now what will that make? Fifty chickens,  
I said—

Fifty times three-and-sixpence—I’ll ask  
brother Ned.

“Oh, but stop—three-and-sixpence a pair  
I must sell ‘em,

Well, a pair is a couple—now then, let us tell  
A couple in fifty will go—my poor brum!

Why, just a score times, and five pair will  
remain

“Twenty-five pair of fowls—now, how tre-  
some it is

That I can’t reckon up such money as this!  
Well, there’s no use in trying, so let’s give a

guess—  
I’ll say twenty pounds, and it can’t be no less

“Twenty pounds, I am certain, will buy me  
a cow,

Thirty geese and two turkeys—eight pigs and  
a sow,

Now, if these turn out well, at the end of the  
year,

I shall fill both my pockets with guineas, ‘tis  
clear”

Forgetting her burden, when this she had said,  
The maid superciliously tossed up her head;

When, alas! for her prospects—her milk-pail  
descended,

And so all her schemes for the future were  
ended

This moral, I think, may be safely attached—  
“Reckon not on your chickens before they  
are hatched”

# THE RED THREAD OF HONOUR

This is one of the best stories of military heroism. It was told to the poet by Sir Charles Napier who commanded the attack on the fortress of Truc away in the India hills. The military of ten English soldiers under a brave man who fought bravely into the fort, where he was killed had a red thread in his bravery that the Mohammedan soldiers before him had given to the victor in reward of his hour round both the wrists of each dead English hero. This was his thread of honour and the adoration of his enemies. Sir Francis Doyle wrote the poem was born April 2, 1818, and died June 8, 1888. He succeeded Matthew Arnold as Professor of Poetry at Oxford.

ELFVEN men of England  
A brave work charged in vain  
Eleven men of England  
Lie stripped and gashed and slain  
Slain but of foes that guarded  
Their rock built fortress well  
Some twenty had been mastered  
When the last soldier fell.

Whilst Napier plotted his wondrous way  
Across the sand waves of the desert sea  
Then flashed at once on each fierce clan  
The day.

Lord of their wild Truckee

These misled the glen to which their steps  
were bent

Mistook a mandate from their hall and  
And in that glorious error calmly went  
To death with out a word

The robber-chief trusted deeply  
Above those daring dead  
Bring here at length he shouted  
Bring quick the battle thread  
Let this last for ever  
Their souls in Allah's will  
But we must keep unbroken  
The old rules of the Hill

Before the Ghaznee tiger  
Leapt forth to burn and slay  
Bleed the holy Prophet  
Taught our grim tribes to pray  
For second chances  
I led through each Indian glen  
The mountain laws of honour  
Were framed for fearless men

Still when a chief died bravely  
We left with green one wrist—  
Green for the brave for heroes  
One crimson thread we twined  
Say ye O gallant hillmen  
For these whose hills are fled  
Which is the fitting colour  
The green or the red?

Our brethren laid in honoured graves may  
wear  
Their green reward each noble savage  
and  
To those whom hawks and hungry wolves  
slay all tear  
Who fare in the red?

The conquering hate and steel fast to the  
net  
For from the heart that haunts you is set  
came  
Beneath a winging moon each mortal  
he left  
I led back its loud acclaim

On a new the law of gallantry  
In a new the law of gallantry  
I found the good world the brave shone  
and  
I led to that crimson thread.

One more he cried The judgment  
Good friends say and let us  
But though the red be given  
Have not more to do?

These were not fired by anger  
Nor yet by lust or greed  
Renown they thought above them  
Nor did they look for gold

To them the red was signal  
Was as the voice of God  
Unmolested and uncompromising  
The path it showed to us and

As without sound or struggle  
The stars unerring in their  
Wider Allah's finger guides them  
Through wonder purple arch  
These Franks and him fly skint  
Without a quick and death  
Went in the air north of duty  
Straight to their goal of death

If I were now to ask you  
To name our bravest man  
Ye all at once would answer  
They call him Mubarak Khan  
He leaps among his fathers  
Dor to our nation land  
With the bright mark of the hill  
I am a man his faithful son

The song the song of Rustum  
Fill all the path with light  
If truth be told it must  
He was a noble knight  
But we are those who  
And strong in the hill  
Would we find him or Rustum  
Have climbed like these the hill?

And they replied Though Mehrab Khan  
was brave

A chief he led himself what risks to run  
Prince Rustum led his life to save  
Which these had never done

In fight he shouted fiercely  
Doomed though they be to fall  
And fast the crimson trophy  
Round the hill was won and it well  
Who knows but that great Allah  
May grudge such a death to his men  
With none so fierce in the heaven  
To the Fand a flaming den  
Then all these gallant men  
Shout in the air  
They raised the slain and red were sent  
They raised the slain and red were sent  
And when we lost their lives  
Left the path in the way  
And Rustum with his own  
That crimson thread was found

Then Napier and his army set out to the  
west

He had a new story to tell  
That shows what was the red



## THE FAIRY TEMPTER

So I found the little girl sitting in the  
of her room, and she was looking at the  
the old book, and she was looking at the  
the old book, and she was looking at the

A fairy girl was sitting in the greenwood  
chamber,  
Last night to the music the spring birds sang,  
When sweeter by far than the birds on the  
tree.

A voice murmured near her, "Oh, come  
love, with me—  
In the greenwood  
A thing of air  
I have not seen as thou art,  
Then come, love, with me."

"With a star for thy hair, and a diamond for thy  
Then wilt thou give thyself to the fairy of  
the night?"

Or if thou wilt, with thine are treasures  
of gold—

I will show thee the hidden place of jewels and  
gold—

And pray ye never  
Be true to the world,  
All these things are mine,  
If thou wilt be mine.

Thus whispered a fairy to tempt the fair girl,  
But vain was the promise of gold and of pearl,  
For she said, "Thou' thy gifts to a poor girl  
were dear,

My father, my mother, my sisters are here—  
Oh, what would be  
Thy gifts to me  
Of earth, and sea, and air  
If my heart were not there?"

## THE MOTHER TO HER INFANT

We have already read a number of short pieces by Thomas  
Miller on the sights and sounds of natural life. In the  
following his theme is taken from human nature, and  
he touches a familiar domestic subject with real feeling.

**SUMBLER** my darling, no danger is near,  
Thy mother sits by thee to guard thy  
repose,

Though the wind roars aloud, not a breath  
reaches here

To shake the white curtains which round  
thee do close.

Then slumber, my darling, and sleep without  
fear,

Thou art safe from all danger, my dearest,  
while here

What is it the angels do unto thee say,  
When thou dost lie smiling so sweet in thy  
sleep?

Are they trying, my sweetest, to lure thee  
away,

And leave me alone in my sorrow to weep?  
Oh, sometimes I fancy they whisper thy  
name,

And would fain bear thee back to the land  
whence they came.

Then never, my darling, when thou growest  
old,

Forget her who on thy sweet infancy smiled,  
To whom thou wert dearer than jewels and  
gold,

Who studied thy looks and thy wishes, my  
child,

Who, when thou didst need her, was never  
away,

In health or in sickness, by night or by day

## THE VOICE OF THE GRASS

We have already read upon the grass a place of the  
of a poem, and yet, of course, it shows the same  
great idea of the poet. It is little more than a  
I have to say, the grass is a very much as the  
with very little and a little else. It is the  
the poet's voice in the form of things in a new way.

**HERE I COME** creeping, creeping everywhere;  
By the dusty road-side,  
On the sunny hillside,  
Close by the noisy brook,  
In every shady nook,

I come creeping, creeping everywhere

**HERE I COME** creeping, smiling everywhere;

All around the open door,

Where sit the aged poor,

Here where the children play,

In the bright and merry May,

I come creeping, creeping everywhere

**HERE I COME** creeping, creeping everywhere;

In the noisy city street

My pleasant face you'll meet.

Cheering the sick at heart

Toiling his busy part—

Silently creeping, creeping everywhere

**HERE I COME** creeping, creeping everywhere,

You cannot see me coming,

Nor hear my low, sweet humming,

For in the starry night,

And the glad morning light,

I come quietly creeping everywhere.

**HERE I COME** creeping, creeping everywhere,

More welcome than the flowers

In summer's pleasant hour;

The gentle cow is glad,

And the merry bird not sad,

To see me creeping, creeping everywhere

**HERE I COME** creeping, creeping everywhere,

My humble song of praise

Most joyfully I raise

To Him at whose command

I beautify the land,

Creeping, silently creeping everywhere

## YOUNG AND OLD

Charles Kim, in these oft-quoted verses sets down a  
whole lifetime of experience. By the quiet contrast of the  
gay days of youth and the grey days of later life he  
conveys a feeling no amount of prose writing could express.

**WHEN** all the world is young, lad,  
And all the trees are green,  
And every goose a swan, lad,  
And every lass a queen;  
Then hey for boot and horse, lad,  
And round the world away,  
Young blood must have its course, lad,  
And every dog his day

When all the world is old, lad,  
And all the trees are brown,  
And all the sport is stale, lad,  
And all the wheels run down;  
Creep home, and take your place there,  
The spent and maimed among,  
God grant you find one face there  
You loved when all was young

## SOUND LOUD THE CLARION

These four lines of verse by the great Sir Walter Scott are  
frequently quoted and well worth committing to memory

**SOUND**, sound the clarion, fill the life!  
To all the sensual world proclaim,  
One crowded hour of glorious life  
Is worth an age without a name

# LITTLE VERSES FOR VERY LITTLE PEOPLE

**A**way birds away!  
Take a little and leave a little  
And do not come again  
For if you do  
I will shoot you through  
And there is an end of you

**O**h ring the bells! Oh ring the bells!  
We bid you sirs good morning  
Give thanks we pray—our flowers are  
gav  
And fair for your adorning  
Oh ring the bells! Oh ring the bells!  
Good sirs accept our greeting  
Where we have been the woods are  
given  
So live for our next meeting  
Then ring the bells! Then ring the  
bells!  
For this fair time of Maying  
Our flowers we bring and while we sing  
Oh hark to what we're saying  
Oh ring the bells! Oh ring the bells!  
We'll sing a song with you  
And may each year bring you good  
cheer  
And each of us a penny

**S**hall I sing? says the Lark  
'Shall I bloom?' says the Flower,  
Shall I come? says the Sun  
Or shall I? says the Shower  
Sing your song pretty Bird  
I'll bloom for an hour  
Shine on dearest Sun  
Go away naughty Shower

**B**arber barber shave a pig  
How many hairs will make a  
wig?  
Four and twenty that seldom he  
Give the barber a pinch of 'puff

**H**ere's Sulky Sue  
What shall we do?  
Turn her face to the wall  
Till she comes to

**H**ow do you do, neighbour?  
Neighbour how do you do?  
Very well I thank you  
How does Cousin Sue do?  
She is very well  
And sends her love to you,  
And so does Cousin Bell  
How do you do, Sue do?

**B**illy Billy come and play  
While the sun shines bright as day  
Yes my Polly so I will  
For I love to please you still  
Billy Billy have you seen  
Sam and Betsy on the green?  
Yes my Poll I saw them pass  
Skipping over the new mown grass  
Billy Billy come along  
And I will sing a pretty song  
Oh then Polly I'll make haste  
Not one moment will I waste  
But will come and hear you sing  
And my fiddle I will bring

**D**amn Tim and her cat  
Sat down far to chat  
The Dame sat on this side  
And Puss sat on that

'Puss says the Dame  
Can you catch a rat  
Or a mouse in the dark?  
Purr says the cat

**B**uy me a milking pail  
Mother mother  
Betsy's gone a milking  
Beautiful daughter

Sell my father's feather bed  
Mother mother  
Where will your father be  
Beautiful daughter?

Put him in the boys' bed  
Mother mother  
'Where will the boys be  
Beautiful daughter?

Put them in the pigs' sty  
Mother mother  
Where will the pigs be  
Beautiful daughter?

Put them in the sitting tub  
Mother mother  
Put them in the sitting tub  
Mother mother

**T**he robin and the red breast  
The robin and the red breast  
Have taken from their nest  
You'll never have again!

The robin and the red breast  
The martin and the swallows  
If you touch one of their eggs  
Bad luck will surely follow

# THE LITTLE MAN IN LEATHER

One misty morning,  
When cloudy was the weather,  
I met a little man  
Clothed all in leather;  
Clothed all in leather,  
With a strap below his chin.  
How do you do? And how do you do?  
And how do you do again?



## HEROES OF THE NETHERLANDS

THE Netherlands were helpless in the sixteenth century in the grasp of Philip II of Spain. The brave Dutch inhabitants tried from time to time to shake off the Spanish yoke but Philip only made matters worse by sending them the cruel Duke of Alva who was a stern and terrible upholder of his authority.

There were at that time in the Netherlands two friends Count Lamoral d'Egmont and Count Horn. Egmont was a chivalrous Flemish nobleman and brave soldier who loved his country but had sworn loyalty to Philip and though he was both vain and rash meant to keep his word and did so. His army and the people were devoted to him in defiance of his popularity with everyone.

Now this country of the Netherlands which we usually call Holland and Belgium now cherished its liberties and would not be forced into accepting the Catholic religion. Though Counts Egmont and Horn were Catholics they upheld this determination and protested against the cruelties of the Inquisition so for that and because he feared their power Philip determined to put them to death. He soon found a way. Having invited the two counts to dine with his son in Brussels the Duke of Alva summoned the two to attend a council. There the captain of the guard d'Amble

Egmont's sword while Horn was arrested in the

courtward. After nine months they were pronounced guilty of treason and Philip gladly signed their death warrants. When news of her husband's

doom reached the Countess of Egmont she at once sought the Duke of Alva and pleaded for the life of her husband for his sake for her sake and for that of their eleven children who would be left penniless on the confiscation of their father's estates. The cruel duke to rid himself of her presence assured her that on the morrow her husband would certainly be released. Yet just before midnight the Bishop of Ypres was sent to prepare Egmont for death.

In that terrible hour the count showed how brave and good he was. Though indignant at being accused of high treason yet he said if he had fallen into error he prayed God his death might wipe away his misdeeds. He wrote too a letter to the king declaring his loyalty. Next morning as he was led to the scaffold he prayed aloud for the king his murderer. Then as he knelt to receive the fatal stroke he filled his hands and cried:

Lord into Thy hand I commit my spirit. Count Horn was brought forward and with the same courageous bearing and the same last prayer met his death.

## THE BOY ON THE BURNING DECK

FROM Corsica came a youth, the boy who 'stood on the burning deck,' whose fame is known to all through Mr. Hemans' poem, given on page 1276 of this book. The Corsicans say that he was Giacomo Jocante Casabianca, a middy who went in the Orient, the flag-ship commanded by his father, with the French fleet that Napoleon took to invade Egypt.

On the evening of August 1, 1798, Nelson sailed up to attack the French vessels as they lay in Aboukn Bay, and some of his ships, getting between the French and the shore, fired on the French from both sides at once.

The English guns were pointed for hours at the Orient, the finest ship of the fleet. Broadside after broadside was fired at her yet still the French flag waved, until from Nelson's Vanguard a deadly fire wounded the captain, and set fire to the vessel. Inch by inch the flames drove back the sailors,

and, one by one, they reluctantly abandoned their guns. Then Casabianca's father, mortally wounded, yet still at his post on the quarter-deck, gave his last order to the faithful defenders of his vessel to abandon her.

Begging him to come with them, they sprang into the water, where many were saved by the English. It was now between nine and ten in the evening, and the flames crept on, while the boy urged his father to jump into the sea with him. The father refused to desert his ship, but prayed his boy to leave him. The son leave his father! No. That was impossible for a Casabianca. He would die with him.

And so the two stood calmly, hand in hand while the flames shot up from the portholes, and the deck caught fire beneath them. At last the end came; and, with a thunderous explosion, the burning vessel sank for ever beneath the blue waters of the Mediterranean.

## THE DEVOTION OF A KING'S DAUGHTER

KING LOUIS XII of France had a daughter Renée, who became Duchess of Ferrara, in Italy, and a Protestant. She was a gracious helper of all who were in distress. It is said that she aided more than ten thousand destitute French soldiers passing through Ferrara from the wars in Italy, and her castle of Montargis became the refuge of the persecuted Huguenots.

One of these, the Prince of Condé, had been imprisoned by the Duke of Guise, but he had a devoted and clever wife who, while visiting him in prison, managed to change clothes with him, so that she remained in his place while he escaped to Montargis.

This change was soon found out, but the Duke of Guise was foiled in all his attempts to trace the escaped prisoner. Then he bethought him that, if the princess were released, she would follow her husband, so he gave orders to set her free. His guess proved correct, she was followed to Montargis.

The Duke of Guise, who had great power in the land, ordered the duchess to give up the prince, but she refused to do so. Even when the king, Francis II, demanded the same thing, and sent troops, she still refused

The prince in his little room overheard the brave refusal to surrender him, but he overheard, too, the timorous fears expressed by a few of the guards, and, turning to these, he cried that since they had not courage to defend him, his death should remove their fears. He hastened on to the ramparts with the intention of exposing himself.

Below him, at the foot of the castle walls, he saw the officer of the artillery, and shouted to him that he was the man they sought, and that on him alone should vengeance be taken, so that he might die, as he had lived, with honour. Much astonished, the officer sent for his leader, who told him that he must certainly fire on the prince.

But the faithful duchess stood by the prince's side, and, seeing the cannon directed against her friend, threw herself in front of him, exclaiming.

"Fire on me, and kill at the same instant the illustrious Condé and the daughter of the king you mourn!"

The soldiers, who adored the memory of Louis XII., implored with one voice that his daughter should be spared, and, refusing to attack the castle, marched off to their tents. The prince and his friends escaped into safety that night.



A everyday scene in one of the sunny streets of the great Spanish port of Seville

## SPAIN AND PORTUGAL

ONE of the oldest fairy stories in the world tells us about the travels and deeds of a certain strong and daring giant on his way from end to end of the Mediterranean Sea. The story was an old one when Greek children listened to it over 2000 years ago. With the shining blue sea dancing before their eyes it was easy for them to follow the hero in imagination to its very farthest end where Africa and Europe nearly meet. For here so the story says to show how far he had gone the mighty Hercules raised two huge rocks called the Pillars of Hercules and they stand to this day one on each side of the narrow straits just nine miles across where the sea joins the ocean.

The far famed rock on the European side over 1000 feet high stand like a guard near the extreme south point of the Iberian Peninsula.

This great mass of land now comprising the large kingdom of Spain and the smaller one of Portugal is roughly speaking about 500 miles square and it lies on the south west corner of Europe between the Mediterranean and the Atlantic. The grand and rugged Pyrenees form its only land frontier. It has been said that Europe ends at the Pyrenees

CONTINUED FROM PAGE 10



so different in many ways is the country beyond them from the rest of the Continent. It is true that its Mediterranean shores in their beauty and fertility remind us of the shores of the other two southern peninsulas and the

coasts of the Atlantic and the Bay of Biscay can be matched in the West of France and the British Isles. It is the centre the inner part—that is to say three quarters of the whole Iberian Peninsula—that is more like Africa than Europe. This part is pushed up as it were some two to three thousand feet above the sea level and across this tableland or high plateau run several ranges of mountains regular like the teeth of a saw generally in an easterly and westerly direction some thousand feet higher still. Between these high ranges run most of the chief rivers draining to the Atlantic.

Rare and beautiful and rugged is most of this inland scenery in strong contrast to the levelness and warmth of that of the Mediterranean coast and of the three chief plains of the country. These plains lie in river valleys, one in that of the Ebro which flows into the Mediterranean between the Pyrenees and the Iberian mountains, another in the valley of the

Guadalquivir between the Sierra Nevada and the Sierra Morena, and the third is found along the western Atlantic shore, widening to the south between the lower courses of the Tago and the Guadiana. The courses of these rivers of the plains present another contrast, for high up on the plateau while they rise they flow, generally speaking, deep down in gorges, between rocky cliffs, useless for watering the land or for serving as routes.

The peninsula furnishes yet another sharp contrast in the matter of its rainfall. The lands bordering on the Bay of Biscay are the wettest in Europe, those on the central plateau are the driest, for the high Cantabrian mountains the continuation of the Pyrenees along the coast seize the moisture of the wet west winds—as the Pennines do in Lancashire—and the valleys of the deep northward slopes, falling 9,000 feet to the sea, are green and beautiful, growing many crops. Ferns and flowers abound, also all sorts of fruit-trees, ripening in the mild climate.

#### THE SUDDEN STORMS THAT SWEEP OVER THE SPANISH TABLELANDS

On the lofty tablelands on the other side of the mountains, which are only 2,000 feet below the peaks, the rain comes in occasional and sudden storms, so that at times the small rivers are dried up, while at other times the larger ones are apt to race unexpectedly down their rocky beds in swollen floods. Hot winds, too, blow at certain seasons over the plateau from Africa, and so we find scarcely any forests or crops upon it. Many sheep and goats of famous breeds feed upon the close pastures, shut in by the teeth-like mountainous walls so bare and rocky.

Round the straight coast of the Iberian Peninsula there is no fringe of lovely islands like those around the Balkan Peninsula, but we have the continuation of the range of the Sierra Nevada reappearing above the sea to the east as the Balearic Islands, often fought for by the surrounding people, though intended by Nature to belong to Spain. On them grow the same fruits and crops as flourish so well round the neighbouring coasts. The people who live to-day in the corner lands of the Bay of Biscay say proudly that they are of the oldest race in

Europe. They are the descendants of the earliest known people in the peninsula, the Iberians, who have given their name to it. They have always been distinguished for their passionate love of independence during the changes that have occurred in the passing centuries.

#### THE OLD ROMAN CITIES THAT HAVE BECOME GREAT AND FAMOUS

The Romans were the conquerors of the Iberians and the Kelts, who came later and mixed with them, and many are the traces of their long stay in the land. Naturally, they settled much along the coast closest to Italy, and many of the cities famous to-day date from Roman times. There is Barcelona, with its beautiful clear air and fine climate, Saragossa, inland, is in the centre of the valley of the Ebro, Valencia, whose beauty has given rise to the saying, "You would take it for a piece of heaven upon earth." Toledo is on the Tagus that "cuts out" its course on one of the Roman roads of the interior, and to the south, on the Guadalquivir, the "great river," rose up the splendid towns of Seville and Cordova. All these belonged to Hispania, whence we get the name Spain.

But it was in the province of Lusitania, formed round about the lower courses of the Douro, the Tagus, and the Guadiana, that Merida, the Rome of Spain, rose up in its grandeur. Here are still to be seen fine ruins of an amphitheatre, a circus, and an aqueduct, and to the north, over the wild rock-walled Tagus, is one of the grandest old bridges in the world. It is half as long again as Waterloo Bridge over the Thames, grey and stained with the weather of seventeen centuries. But the nation of soldiers and builders had to leave the fine roads and the camps, the cities and monuments of the peninsula, as they had to do in Britain and Gaul, when the empire began to grow weaker.

#### THE FIERCE TRIBES THAT POURED DOWN UPON SPAIN FROM THE NORTH

Hordes of German tribes, among them the Goths and Vandals poured down from the north and took possession of nearly the whole of the peninsula. By degrees the Goths gave up their fierce religion for Christianity, and churches and monasteries rose up over the country as the people became more civilised. But with civilisation their character

## SPAIN AND PORTUGAL

seemed to grow weaker. There were many Gothic kings some of whom held sway over the states that were forming as the years went by more or less on the lines of the Roman provinces.

Some of the states did not grow into shape till later on though broadly speaking the provinces of to day are survivals of the old states and kingdoms and in most cases their great cities and towns were the old Roman capitals.

Catalonia with its capital Barcelona Valencia and Murcia lie on the fertile

central plateau and Aragon in the upper valley of the Ebro with Saragossa for its capital.

The rule of the Christian King over most of these states came to a sudden and tragic end at the beginning of the eighth century. Over them from Africa came a great host under a crescent banner then war was word was God is great and Mohammed is His prophet. They poured into the peninsula under the shadow of the Pillar of Hercules that we call Gibraltar



The Spanish Peninsula is one of the most fertile parts of the world. At its southernmost point it nearly touches Africa, and the narrow Strait of Gibraltar connects the Atlantic with the Mediterranean. The north coast is a high and rugged one, and yet the land is so fertile that it is one of the most cultivated in the world.

east coast and Andalusia with its host of great towns is on the south. These are the garden provinces of Spain famous for flowers and palm trees, grapes and olives, oranges and lemons.

Portugal on the lower Lusitanian Atlantic seaboard stretches right up to Galicia in one broad strip. Cape Finis terra the end of the Roman land lies on the rocky coast of Galicia some times called the Switzerland of Spain and to the east of this land of independent pirated mountaineers lies Leon named after the seventh Roman king. Old and New Castile lie on the

now from Gebel Tark the Rock of Turk who was the leader of these Mohammedan Saracens or Moors. They landed in 711 and in the course of a few years the Moors spread nearly all over the peninsula and on through the passes of the Pyrenees over the fair plains of France as far as Tours. Here they were stopped by Charles of the Hammer and the Mohammedan wave which might have spread over Northern Europe and even across the Channel was turned back southwards by this victory across the mountain barrier which it had come. It was nearly 800



years before the power of the Moors came to an end in the peninsula itself.

Many champions rose up, and great efforts were made through the centuries to dislodge the "Pagans," the "Inhdels," as the Christians called the Moors who were equally anxious to spread the worship of Mohammed by crushing out the Christians. We know how Charlemagne, grandson of Charles of the Hammer, came fighting to the rescue, and how his nephew Roland made a most heroic retreat through the gloomy pass in the Pyrenees. Later, the great national hero, the Cid, or Conqueror, performed surprising feats against the Moors, which, like those of Roland, are the subjects of many favourite stories. Some English Crusaders came, too, and found pleasure and adventure in helping on the struggle. But for a long time the Moors held their own. Besides being warlike and fearless in spreading their faith, they were industrious and clever. They understood how to use rivers to water and fertilise dry soil. They were splendid gardeners, and introduced all sorts of new trees and flowers.

#### THE WARLIKE MOORS, WHO MADE SPAIN A FAIRYLAND OF GARDENS AND PALACES

But, above all, they were wonderful builders. As we travel over the peninsula to-day, amongst the greatest marvels that we see are the remains of Moorish buildings, their palaces and mosques, and the fortresses and castles which were built across the central highlands, are amongst the wonders of the world.

The foothold for the eventual reconquering of the country by the Christians was on the north. From the highlands of the Pyrenees and the Cantabrian mountains, the Moors were driven first over the Ebro valley. Then the kingdoms of Leon, Castile, Aragon slowly extended their borders. We read, on page 1250, the story of the princess of Castile who married an English prince, and went with him to the Crusades. Next, Leon and Castile gained power by union, and the Moors had to retreat over the high plains and across Andalusia into the south. Their last province was Granada, which they held for another two centuries. During this time most of the Christian states were drawing closer together on their way to become one united Spanish kingdom.

But Portugal stood alone. The Spanish and Portuguese people belong to much the same stock, and so do their languages. Geographically, there was no reason why this Atlantic province should remain distinct and independent when the others tended to unite. There is no natural division line between it and the rest of the peninsula.

#### HOW THE SEA CALLED THE PORTUGUESE TO CONQUEST AND DISCOVERY

Its mountains are the ends of the ranges of Spain, its chief rivers are the useful lower courses of the rivers of Spain. It had been overrun by the Germanic tribes like the rest of the peninsula, invaded by the Moors in the eighth century, reconquered from them by Castile, and it had been able, one hundred years later, to set up the first of its independent kings.

Half the Portuguese boundaries are the rolling waves of the Atlantic, and when the kingdom had settled down a little there was leisure and opportunity to listen to the insistent call of the sea, which is ever felt by those who dwell beside it; so they built ships fit for more than coast voyages. The story of how the Portuguese enlarged their borders over the neighbouring western islands and onwards, and how they showed the way to India round the Cape of Good Hope, we read on page 39. Prince Henry, the Navigator, who did so much to encourage the explorers, was the grandson of an Englishwoman, Philippa of Gaunt, who was granddaughter of the old warrior Edward III., and his good queen, Philippa, whose story we read on page 748.

Portuguese sailors also found their way to Brazil, where later rich mines of gold and diamonds brought great wealth to the little mother country. It was about this time that Lisbon, so beautifully situated on the fine harbour at the mouth of the Tagus, became one of the richest cities in Europe, and Oporto, another great harbour on the Douro, began to grow rich from trade with distant parts.

#### THE KING AND QUEEN WHO MADE SPAIN ONE COUNTRY

Spain was not slow in following Portugal to enterprising discoveries and conquests far beyond Europe. In the picture on page 36 we see the two sovereigns, Ferdinand of Aragon and

# THE ENEMIES OF SPAIN IN RETREAT



For nearly 800 years the Moors ruled in Spain, but gradually they were pressed back until, at last, in 1492, their last stronghold Granada surrendered. He was King Ferdinand and a daughter Queen Isabella, sealing the keys of the city from the last of the Moorish kings, who as he looked back upon the towers he had left for ever wept bitterly. The rock from which he took this final look is still known as the Last Sight of the Moor.



When Napoleon forced his brother Joseph upon the Spanish throne, they king they rose in revolt against the French army that had invaded their country. The English, under Wellington, went to the help of Spain, and the Battle of Salamanca was the result. After much fighting Wellington inflicted a crushing defeat upon the French at Vittoria, and the French left the town a sorry flying mob, as shown in this picture by R. H. R. Ford. Joseph Bonaparte was just escaped leaving his carriage and even his papers behind.

Isabella of Castile, whose story is told on page 2413, listening to Columbus. It was the marriage of Ferdinand and Isabella that united their kingdoms, and made it possible to gather enough strength together to displace the Moors from Granada, and thus bring the Moorish dominion to an end.

What exciting times they were! Columbus was pleading so anxiously for help and men to cross the seas, and Isabella herself, dressed in armour, was in the midst of the army, while the siege of Granada was going on. The tent in which were the royal children was knocked over, and they nearly fell into the hands of the Moors. Little Catherine was there who grew up to be the wife of Henry VIII., so familiar to us in English history as the dignified and unfortunate Catherine of Aragon. In later years, when sad and ill in a damp, grey country, how often must Catherine have thought of the bright home of her childhood, with its sunshine and white-crested mountains. In the cathedral of Granada are still to be seen pictures, statues, and personal belongings illustrating those years and amongst them is a banner worked by Isabella, which was hoisted over the conquered city when the Moors left.

#### THE FAIRY PALACE ON A HILL, WHOSE WALLS ARE LIKE LACE

For it became the favourite residence of Catherine's parents, and great was their interest and delight in the magnificent palace that had been built on a hill close by the city by generations of Moorish kings. The Court of the Alhambra at the Crystal Palace gives some idea of the wonders of Moorish decoration, and many travellers to Spain have recorded their delight at the glories of the numberless courts and galleries, the halls and lovely gardens with marble baths and fountains, of this wonderful spot. All is so beautifully painted and carved that the walls seem "woven like a cloth, rich as brocade, transparent as lace, and veined like a leaf." By moonlight especially it is a true fairy palace. All the decay of centuries seems to disappear under the soft silvery beams glancing through the fretwork and windows and flooding the open spaces. It all seems like a living enchantment straight from the romantic times of the Arabian Nights.

And this is by no means the only beautiful relic from Moorish times. In Seville there is a palace in which the Hall of the Ambassadors is one blaze of lovely colours from the marble floor to the mother-of-pearl and crystal roof.

#### THE PINK TOWER OF PRAYER, FROM WHICH MEN WATCHED THE STARS

Here is also the wonderful tower, called the Giralda built by the Moors as a prayer-tower, and for an observatory from which to watch the stars. Its colour is a delicate pink; the view from the top of the heads of the Guadalquivir, amongst the sunny green plains, is most exquisite.

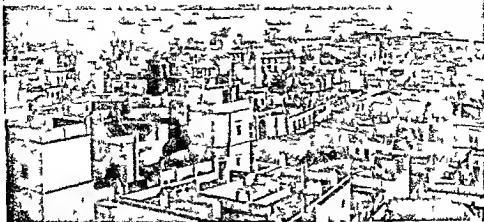
Both Catherine and her sister Joanna must have enjoyed all this beauty in their young days. It was the son of Joanna who became Charles I. of Spain, famous in history as the Emperor Charles V. He was ruler not only over a large part of Europe, but of an immense dominion across the ocean, for in his reign Mexico, China, and Peru were added to the already large and rich belongings of Spain in the West Indies. This great sovereign paid a long visit to his aunt in England, and it was his son Philip who married her daughter, Mary Tudor, the year after she became Queen of England.

This marriage was very unpopular, for English people were afraid that liberty, chiefly in the matter of religion, would be crushed by the same methods as in the bridegroom's country. In his grandparents' time a Court had been formed with powers to inquire about everyone's faith, and to punish all who did not agree with the Church of Rome, to which, as a nation, the Spanish have always been very firmly devoted. At first it was directed against the Mohammedan Moors and the Jews, but when, in Reformation times, men began to assert their rights to worship God in the way they believed right, all the terrors and cruelties of the Court were directed against them.

#### HOW THE LITTLE TOWN OF MADRID BECAME THE CAPITAL OF A MIGHTY EMPIRE

This Court of the Inquisition was busy in Philip's reign, not only in his own country, but in the Netherlands, and many people were tortured and burnt because they would not return to the old faith. It was this Philip II who chose Madrid, then but a small town, to be

# IMPORTANT CITIES OF SPAIN & PORTUGAL



Cádiz is one of the most important commercial cities and naval centers of Spain. It was founded 1600 years ago by the Phoenicians. It has been burned twice in the 16th century by the English. It was burned down by the British in 1812.



Oporto is the second city of Portugal, situated on the steep rocky banks of the Douro River, three miles from the sea. It has a large trade. It is the principal place of port wine which is made in Oporto.



Cadiz is the principal harbor and dockyard of Spain, and an important port. It is every day being built up, when it was founded by H. Admiral, the Carthaginian general, who called it New Carthage.

the capital of the newly united kingdom of Spain. It is near the centre of the peninsula, and is now one of the finest cities of Europe, though it has no natural advantages for a capital beyond its central position. It is on a high, bleak plateau, dry and shadeless, surrounded by grey rocky mountains. It has no navigable river, communication with the rest of the country was long difficult. Its climate is unbearably hot in summer, and piercingly cold in winter.

**THE PRICELESS ART TREASURES THAT ARE STORED UP IN MADRID**

Ever since Philip's day magnificent buildings have been erected by succeeding sovereigns. It would take months to see all the splendid pictures, not only of Spain's greatest artists such as Velasquez of whom we read on page 780, and Murillo but of the masters of Italy. We can find illustrations for all Spanish history in the galleries as well as in the National Museum, and in the famous collection of arms and armour. Here are the swords of Spain's noblest champions, of Roland and of the Cid, here are banners and tents taken from the enemy, from the times of the Goths and Moors, and amongst many other most deeply interesting things there is a suit of armour belonging to Philip II, with the arms of England engraved upon it, which he wore when he sat for his portrait to the great artist Titian.

About thirty miles away from the new capital, Philip built a country residence for himself, and joined to it a monastery, a church, and a burial vault for Spain's royalty, all in one enormous block. This is the Escorial. Its grand and gloomy style suits well with the bare, rocky country in which it is placed. Philip said he wanted only a cell in which to rest his weary body, but his successors have beautified and enlarged the buildings in every possible way.

**HOW KING PHILIP SAID SILENT WHEN HE HEARD NEWS OF A GREAT VICTORY**

The seat in the church occupied by Philip when the news was brought to him of the victory of Lepanto, of which we read on page 3157, is still shown. It is said that he remained impassive till the end of the service, and then he ordered a solemn thanksgiving to be sung. The good news of this check to the sea-power of the Turks had taken just a month to come from

the coast of Greece. Though in many respects the reign of Philip was the time of Spain's greatest riches and glory, he had many troubles, too, and his face looks weary enough in his portrait in the National Portrait Gallery, in London, which describes him as "King of England." The loss of the gallant Armada, with the failure of his plans upon England, was a bitter blow, and the constant "singeing of his beard" by the daring sea-lovers of that country must have been very trying.

To the south of Madrid is the district of La Mancha, made famous by Cervantes who lived about these times, in his celebrated story of Don Quixote, which we read on pages 843 and 959. Here there are still old windmills to be seen waving their long arms over the dreary-looking country.

It was in Philip's days that Portugal fell to Spain, and remained united with her for sixty years, after which it reasserted its independence. The daughter of the first of its new line of kings was Catherine of Braganza, the wife of Charles II. Part of her marriage dower was Bombay, which proved to be an important foothold for England in India.

**BRITAIN'S ROCK FORTRESS THAT GUARDS THE ENTRANCE TO THE MEDITERRANEAN**

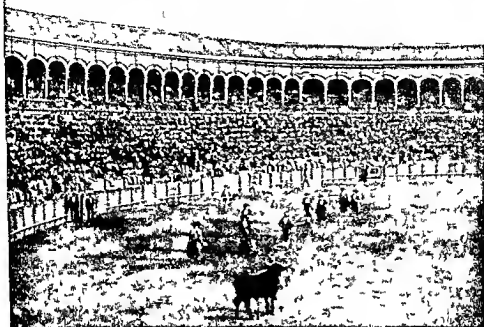
Soon after Portugal was lost to Spain, the Netherlands succeeded in shaking off Spain's heavy yoke. After this came endless years of war between Spain, France, Austria, and England, during which time Louis XIV. was for long a central figure.

One of the chief subjects of dispute was the succession to the Spanish throne. It was during this war in 1704 that Gibraltar was taken by the British. It withstood a tremendous siege about sixty years later. It is still the British flag that waves over this Pillar of Hercules guarding the entrance to the Mediterranean Sea and the route to India by the Suez Canal.

The famous "wooden walls" of Old England were frequently seen in those days cruising about the approach to the Straits of Gibraltar. Two years before the great siege of the Rock, a victory was won over France, helped by Spain, off Cape St. Vincent. It was the same year that saw Lombardy conquered by Napoleon.

A few years later the fleets met again near the same part of the coast. This

# THE CRUELLEST CROWD IN THE WORLD



The Spanish people are probably more callous to suffering than any other nation. Nowhere else would bull fighting be carried on in Spain be tolerated as the national amusement. The heartless people engaged in this are amused by the sight of suffering. The sufferings of the bull in a fight are as other things compared with those of the horse. Here we see the close of a bull fight, with the matador about to kill the bull.



Another instance of Spanish indifference to suffering is the way the guillotine was introduced in Spain right down to the 19th century. Although this institution was introduced into other countries, it was the terrible Spanish guillotine that became a by-word for all that is most cruel in history. Terrible tortures were inflicted by the Inquisition, and in this picture we see the Duke Inquisitor waiting for their next victim.

time it was off Cape Trafalgar, and on October 21, 1805 Nelson won his last and most famous victory. But, in spite of this and other checks by sea, Napoleon went his own victorious way by land in Prussia, Italy, Holland, and then came the turn of the peninsula. Some first aggressions having been passed over, France tempted Spain to agree to divide Portugal between them.

#### HOW THE OLD WORLD WAS RULED FROM THE NEW WORLD

The Portuguese royal family and the Court fled in alarm over the sea to their great possessions in Brazil, and for many years this European state was ruled from the New World. But before long Napoleon took advantage of the quarrel between the King of Spain and his son, and a French army entered Madrid and proclaimed Joseph Bonaparte king.

But all Spain rose at this action of Napoleon, and England, in indignation and alarm, quickly sent out supplies and two small armies under Sir John Moore and Sir Arthur Wellesley—who later became Duke of Wellington—to help to make a stand for the independence of the two kingdoms in the peninsula. For six years the war spread itself over the high tableland so difficult to cross and so trying in its extremes of climate. Heroic defences were made, and the peasants who lived in the little grey villages were always ready to rush out and harass the French. The defenders had some success in both Portugal and Spain, and then the tide was turned by the appearance of Napoleon himself. It is just 100 years ago that Sir John Moore made a masterly retreat to Corunna in Galicia, where he lost his own life, but saved the honour of his troops. After this Northern and Central Spain fell into the hands of France. Wellington, with fresh troops, gained a victory at Talavera which restored the fame of English arms. His next work was to wait patiently, holding his ground in the three famous lines of defence which he threw up at Torres Vedras, near Lisbon.

#### NAPOLÉON'S VAIN BOAST AND HOW HIS ARMY WAS DRIVEN OUT OF SPAIN

At last his patience was rewarded, the French general had to give up trying to drive Wellington out of Portugal, and then the chance came of doing something in Spain. Napoleon had been

obliged to draw away some of his best old soldiers to help in the war with Russia, and, in consequence, many towns in Spain were won back, and Joseph was forced to leave Madrid. So was rendered vain Napoleon's boast, "I hold it at length, this Spain—so greatly desired," which he uttered as he put his hand on one of the white marble lions, going down the grand staircase in the Royal Palace of Madrid. Finally, after many ups and downs, the French were driven, after the defeat of Vittoria, across the Pyrenees. Months before that, the veterans who had so long held Spain for Napoleon lay frozen dead on the bitter road from Moscow.

The nineteenth century was a troublesome one for Spain. By degrees she lost most of the colonies that had enriched her so much in the past. Peru and Mexico became independent, Florida was sold, Cuba and the Philippines passed to the United States of America. There were also many disputes about the succession to the crown and the form of government, which led to civil wars and constant changes which nearly ruined the country.

#### THE BUILDING UP OF SPAIN UNDER ITS YOUNG KING AND HIS ENGLISH QUEEN

But now things are more settled. The constitution—for long a mere name—is duly observed. The young king, Alphonso XIII, has married an English princess, and they have two little sons. Prosperity is increasing, as railways, which are very difficult and expensive to build in the central plateau, are gradually stretching over the country. Agriculture is improving, and more attention is being paid to mining and manufactures. Spain is very rich in metals, iron and coal are worked in the north, and the famous mines of Rio Tinto in the south supply a quarter of the world's copper.

Portugal had also had many civil wars and difficulties to contend with in the nineteenth century, and Brazil became independent, but once more the gallant little kingdom, so firm an ally of Great Britain through the years, is reviving under happier conditions. For size and population Portugal may be compared to Ireland.

The capital of Portugal—Lisbon—was almost destroyed by a terrible earthquake in 1755, but it is now rebuilt, and is a beautiful and interesting city.

doing a great deal of trade. From Oporto comes the wine known as port.

Many visitors go to Spain not only to enjoy the fine climate round the coast but to see the grand old towns which show so many traces of the history of the country.

We have already glanced at the relics of the Romans and of the Moors. Belonging to the Christian times are magnificent cathedrals in nearly every city and rich treasures of pictures.

The beautiful Moorish Giralda Tower in Seville is now the belfry tower of the splendid cathedral—the largest in Spain famous for its rich sculpture and fine pictures. It is said that there is never

and the wonderful cathedral was once their chief mosque. A thousand columns of beautiful marble support the roof and look like a forest of stone.

Toledo has a grand position on a rocky height round the base of which the Tagus circles. Its cathedral is very large and rich and at every corner of the ancient city are reminders of its strange and wonderful past.

The old Roman Barcelona has grown into a city ten times as large and is now the first port in Spain standing on one of the most lovely sites on the Mediterranean shores. It is often called the Liverpool of Spain from its numerous manufactures and busy commerce.



With a Philip II came to the throne of Spain he succeeded to an empire which a Caesar might have envied. It was in fact the first empire upon which the sun never set. But Philip was an incompetent bigot and his policy led directly to the break up of the mighty empire. The break up began in his own reign by the war of the Netherlands a revolt caused by the introduction of the legislation later that he died. Here we see Philip in his palace at Madrid accompanied by his priestly advisers, receiving a deputation from the Low Countries.

a day in Seville when the sun does not shine everything is bright and gay, the golden oranges, brilliant flowers, glossy palms, and white houses, with their pretty courtyards. Though the city is about sixty miles from the sea, fair sized vessels can pass up the river and unload on the quay. After the return of Columbus from his first voyage, the city had a great trade with the Indies. In Seville are thousands of girls making cigars and cigarettes, and the dark little boys running about the streets night have been made for Mirillo. Both the artists Murillo and Velázquez were born at Seville. Cordova also on the Guadalquivir was once the greatest city of the Moors.

There is a fine view of the harbour always full of shipping from the lofty monument to Columbus. His figure on a golden ball is 23 feet high. It stands opposite the handsome street called the kamilla shaded by trees, like the Unter den Linden at Berlin. There is also a handsome cathedral.

Cadiz most picturesquely situated on a rocky peninsula with beautiful bays and harbours is sometimes called the Venice of Spain. It used to be its chief port. Much business is still done round the harbour. Most of the houses have view towers from which to look out to the open sea. It has been said that the best impression of Cadiz would be given by writing the word white.



with a white pencil on blue paper, so blue are the sea and sky, so white the buildings! Nearly all the large cities of Spain lie on the coastal plains on which two-thirds of the people of Spain live. Madrid is the chief exception, in which are about half a million of the inhabitants. Though Spain is larger than Great Britain, there are not half as many people in it.

The people of the Iberian Peninsula come of a very noble and ancient stock. Foreigners often consider them proud, but a great deal of their grand manner, especially amongst the peasants, is prompted by self-respect. The chief national amusement is the famous bull-fight, which is held in the chief cities at

While studying or drawing the map of the peninsula of contrasts or modelling its rugged surface, there is much to think over and "see" with the inward eye. We know where to look for green valleys and ashy mountains, some tipped with snow, for the bright gardens of vines, olives, oranges, nuts, and the trackless wastes. And as we glance again round the long coast, what a pageant rises before us, of the Roman galleys, bringing soldiers and colonists, of the Moors pouring in near Gibraltar, of the little ships of Columbus sailing to the golden West, pilots of the rich treasure fleets—the "galleons of Spain" which Drake and others used to intercept.



The Alhambra, the magnificent home of the ancient Kings of Granada, has been described as a fairy palace out of the Arabian Nights, with walls as transparent as lace and veined like a leaf. It is surrounded by a mile of walls.

holiday times, and to which all the people go gaily dressed in their best, to watch the fighting of men with bulls. The animals are goaded and excited in every possible way, and great are the skill and daring of the toreadors. These men do part of their work on horseback, and it is terrible to think of the sufferings of the poor horses and bulls. The men, too, are sometimes badly hurt. It is a horrible and cruel thing, of which men and women ought to be ashamed, but, unhappily, we in England cannot say too much about the barbarity of it so long as we ourselves hunt tame stags and shoot tame pheasants, and set dogs on to timid hares, and call it "sport."

And then we see the gathering and sailing of the mighty Armada in all its glory, and from time to time through the centuries the bridal trains of princesses of the peninsula on their way to become Queens of England.

At Corunna is the grave of the gallant Sir John Moore, and Spanish earth holds many another hero of the Peninsular War. The great duke, who lived to fight many more campaigns, lies in St. Paul's Cathedral. Amongst his greatest victories are those whose names we can find in the Iberian Peninsula, for it is the hardest thing in the world to play a waiting game with really patient courage. The next story of Countries is on page 3455.

# THE NOVELS OF THACKERAY

HAVING read the charming story of *Henry Esmond* we must now read its continuation in *The Virginians*. Strictly speaking the one story is not a sequel to the other as that means a second story in which all the characters of the first reappear and this is not the case in *The Virginians*. Still it is usually spoken of as a sequel to *Henry Esmond* as several famous characters in that story reappear in *The Virginians* together with their children and grandchildren. Although it is a fine and moving romance it lacks something of the charm which we find in *Henry Esmond* as *George* and *Harry Warrington* though both manly and lovable characters have not the splendid qualities of their grandfather *Henry Esmond* while their mother has little of the charm of *Lady Castlewood* whose daughter she was. *The Castlewoods* of the younger generation are also a contemptible set but *Beatrice* is perhaps more sympathetic in her old age than she was as a young woman.

## THE VIRGINIANS

### THE STORY OF HENRY ESMOND'S DESCENDANTS

COLONEL ESMOND had various reasons for leaving England at the close of the reign of Queen Anne. Having become so deeply involved in the Jacobite plots which were designed to place the son of James II. on the English throne at the death of Queen Anne but failed for reasons stated in *The History of Henry Esmond* he considered it wise to leave the Old Country. There was also the promise of a new and tranquil life for him in America wedded to *Lady Castlewood* whom he had loved so well and served so loyally. It will be remembered that we left them both happy in their new life in Virginia where the colonial estates of the Viscount *Castlewood* which were Esmond's by right had been given to him by his stepson the young Viscount.

In the new *Castlewood* as they had called their Virginian home in honour of the ancestral mansion in England a daughter *Rachel* was born to the Esmonds and she grew up a lively and energetic little woman immensely proud of her parentage as she had good reason to be. Like her mother before her *Rachel* married at an early age her husband being the younger son of a Norfolk baronet. His name was *George Warrington*. They were not fated to enjoy a long married life and *Rachel* found herself a widow while still a young woman. She had however two sons *George* and *Harry* who were



twins. As *George* was ushered into the world just half an hour before *Harry* he was the heir to the estate and *Harry* was brought from his earliest years to respect him as his elder brother. On the death of his dear wife

*Colonel Esmond* now well advanced in years gave over the management of his property to his daughter *Rachel* who had shown the most remarkable capacity for the work and whose business like energy was known throughout Virginia. She was a little lady with a great belief in her own opinions and having very rigid ideas of her importance as the daughter of such distinguished parents she asserted herself to such an extent that in time she quarrelled with most of her neighbours as well as with her own sons. She even managed to fall out with her relatives in England by means of correspondence. Her husband had been dead but a short time when she gave out that she was to be known as *Madam Esmond* being prouder of her own name than of *Warrington* although the latter was not without honour. And on the death of her father she recognised her son *George* as the heir of the estates regarding him somewhat in the light of a young king for whom she was playing queen regent.

When the boys were fourteen years old they were left a legacy of several thousand pounds by an aunt and

the imperious Madam Esmond was greatly annoyed when the London lawyer would not recognise her claim to do with the money as she wished

She would have kept it all for Harry, and because George sided with the lawyer in thinking it should be divided between them she reproached him with his meanness and decided she would save up for Harry's fortune

#### THE WHIMS OF MADAM ESMOND AND THE BROTHERLY LOVE OF HER BOYS

Thus she went on through life when she was "out" with one she was usually "in" with the other. It was a happy thing that none of their mother's whims affected the brotherly love of the two boys, who were devoted to each other. Harry was the stronger of the two, but as a boy George was quite as mischievous as his brother, and in a quarrel with a dull and prosy tutor named Ward, whom Madam Esmond admired and had appointed over the lads, George was so successful that the tutor had soon to leave, and Madam Esmond realised from that day there was a master, as well as a mistress, at Castlewood.

Later on, the young master of Castlewood proved that he had inherited something of his mother's hasty temper, when he challenged young Major Washington to a duel, in the belief that the major had made an offer of marriage to the fair mistress of Castlewood.

A gossiping lady companion of hers—Mrs Mountain—who seemed to think that every bachelor gentleman who visited Castlewood was in love with Madam Esmond, had been responsible for the story, which was quite without truth. Thanks to Harry, who was a great admirer of the young George Washington, the matter was explained, and George apologised.

#### GEORGE WARRINGTON IS THOUGHT TO HAVE FALLEN IN BATTLE

The efforts of Great Britain to clear the French out of America were now about to be pushed forward with some determination. General Braddock, an officer of great distinction, was sent to the American colonies to organise the operations against the French. On his staff George Warrington became an officer, and so left home to take part in the fighting. Letters were regularly received from him at Castlewood, and

read out by Harry to his mother and Mrs Mountain, but one day came news of a terrible disaster that had overtaken Braddock's forces, and left the French and their Indian allies for the moment victorious. This news did not come from George, and, fearing he might be among the fallen, Harry set out for the front in the hope of discovering his brother's fate.

The death of Braddock left Dunbar in command of the forces, and to the camp of that commander Harry repaired, having heard that one of Braddock's officers was lying there ill with fever. He found, however, that this was not his brother, but his friend George Washington, now colonel, who could give him no good news of George, and believed him to have perished at the hands of the Indians.

Colonel Washington, on recovering, accompanied Harry back into Virginia, and had the pain of listening to the unreasoning reproaches of Madam Esmond, whose sorrow for the loss of her son, combined with her usual hasty temper, led her to accuse the colonel of having abandoned George to his fate.

#### WHY HARRY WARRINGTON LEFT VIRGINIA ON A VISIT TO OLD ENGLAND

As a consequence of this, life was gloomy and cheerless on the Virginian estate, and, to make matters worse, so far as Harry was concerned, the fever marked him out for a victim. When he was recovered sufficiently he was advised to go away on a sea voyage, and thus came the idea of his visiting the old land of England. Soon after he set sail for England, his mother left the plantation for her town house in Richmond, a thriving young colonial town, where she set up her little throne to continue her harmless amusement of playing the part of queen over the local colonial society.

It was in the summer of 1756 that Harry Warrington arrived in England, accompanied by his negro servant, Gumbo, and took coach from the port of Bristol to Castlewood House in Hampshire, the ancient home of his grandfather's family. Times had changed greatly at this old Castlewood. Harry's Uncle Frank, for whose sake Colonel Esmond had not asserted his undoubted right to the title and estates, was dead, and the new viscount had

# THE OLD BARONESS WHO WAS ONCE THE LOVELY BEATRIX



One day the baroness had Harry brought to her in the dress of Queen Anne's day and said "Harry that was my face once and the lady Beatrix Emond, my mother's half sister."

none of the nobility of his father's character. Indeed there was nothing to admire in the new family circle at old Castlewood drinking gambling and gossip-mongering occupying most of their time.

This of course was not known at first to Harry who calling at the mansion in the absence of the owners was very coldly received by the servants. He left a note for my lord on his return and betook himself to the village inn. The family returned soon after Harry's call but when the Baroness Bernstein the aunt of the viscount arrived late at night they had done nothing to welcome their Virginian cousin. Indignant at their ill-manners she insisted that one of her nephews repaired at once to the inn late though the hour was and invited Harry to Castlewood House she would do so herself. This admission the viscount's younger brother William who was so common in those days was fuddled with drink every night set out for the inn only to raise a

quarrel there with Harry who had gone to bed and finally to be brought back in a wheelbarrow.

Early next morning the baroness made good the ill-manners of her nephews by sending a note to Harry inviting him to Colonel Esmond's house in England and when he arrived she presented him with all her charming old courtesy to his relatives. Harry immediately became a great favourite with her and later when Gumbo had circulated exaggerated stories about the wealth of the Virginian estates now supposed to be Harry's property the selfish low-minded Castlewoods also began to take some interest in him.

One day the baroness when talking with Harry showed him the portrait of a lovely young woman in the dress which was worn in the time of Queen Anne and she said to him "Did your mother never tell you of a daughter her mother had in England before she married your grandfather?"

She never spoke of her father said

"Nor your grandfather?"

"Never. But in picture-books for us children he used to draw a head very like that," said Harry, looking intently at the beautiful face in the portrait.

"And does the picture not remind you of anyone?" pursued the baroness, with a touch of sadness in her voice.

"No, indeed," said he.

"Harry that was my face once, and then I was called Beatrix Esmond, and your mother is my half-sister, child, and she has never even mentioned my name!" she said very quietly.

**BEATRIX GROWN OLD IS KIND TO HENRY ESMOND'S GRANDSON**

The baroness was indeed the wayward Beatrix of long ago who had caused much sorrow to her mother, and had fluttered the heart of Colonel Esmond. In her old age she had a melancholy pleasure in showing kindness to the grandson of those to whom her conduct had once given pain.

Harry's time was now passed in none too intellectual pursuits, for he soon fell into the habits of the house, playing at cards for money with his drunken cousin, Will, and Parson Sampson, the Castlewood chaplain, who resembled many of the clergy of his time in being more given to pleasure than to good work. He also found himself an object of particular interest to Lady Maria, Lord Castlewood's step-sister, who endeavoured to pass for twenty-seven, though her age was forty. Prompted by Gumbo's stories of Harry's wealth, this designing spinster had conceived the idea of becoming Mrs. Harry Warrington, and Harry innocently was in a fair way to encourage her in her scheme. But the baroness set herself to thwart the plans of Lady Maria for Harry's sake, and took every opportunity of letting him know the truth about that person.

**HARRY BECOMES A "YOUNG MAN OF FASHION" AND IS IMPRISONED FOR DEBT**

On his way to Tunbridge Wells, a fashionable place of resort at that time, a riding accident was the cause of his being carried to the house of Colonel Lambert, whose wife had been at school with Harry's mother, when Rachel Esmond had been sent to England for her education.

The home-life of the Lamberts was so wholesome and unaffected, com-

pared with the low tone of the Castlewoods that Harry felt as if he had passed into another world, and could have lingered indefinitely with them, enjoying the society of the colonel's daughters, Theo and Hester, for the former of whom he speedily conceived a tender regard. But he was bidden to join his relatives at Tunbridge, where his easy good-nature let him be led into ways that did him no credit. Among the gay gamblers he was soon a man of note, though many stories of his conduct were exaggerated, and when he moved to London to continue the life of a young man of fashion, he soon found himself in gaol for debt.

On news of this reaching the baroness she was ready to help, but meanwhile the artful Lady Maria had effected a little plan to win the heart of Harry by visiting him in prison, and bringing all the trinkets and jewels he had given her, in order to raise money for his release. His simple, honest heart was touched, and he now felt bound to Maria, so that when the baroness offered to pay all his debts on the condition that he would give up Lady Maria, he refused, and no doubt thought himself a very gallant gentleman in consequence.

**GEORGE WARRINGTON COMES TO LIFE AGAIN AT AN OPPORTUNE MOMENT**

Harry was still in prison when, one day, to the amazement of the baroness, "Mr. Warrington" was ushered into her room, and for a moment she was bewildered, as her visitor was extremely like Harry. He was none other than his twin brother George, who had not been killed, as was supposed, but, after a term of captivity, had been enabled to make his escape, and had now come to England in the nick of time to save Harry from a foolish step.

George was able to effect the release of his brother, although Colonel Lambert and Colonel Wolfe, good friends of Harry's whom he had treated none too well, were taking steps in the same direction before George's timely arrival. Freed from prison, Harry still foolishly persisted in his declared intention to marry Maria, and the baroness now determined to join forces with George in the hope of turning Harry from his purpose. After she had explained the trickery and hypocrisy of Lady Maria to him, George decided to put Maria to the test. By posing as the

selfish elder brother he gave out that Harry having squandered his own fortune would receive no help from him and would be dependent on the capricious favour of his mother for the future. This speedily altered the mind of Lady Maria who had no wish to be Mrs. Harry Warrington in the absence of a fortune and fortunately she herself took the step of freeing Harry from his promise to marry her.

#### HARRY FIGHTS AT QUEBEC WHILE GEORGE REMAINS IN ENGLAND

Depressed in spirits and perhaps just a little jealous of the interest which Mistress Theo showed in his brother George, Harry joined a naval expedition as a gentleman volunteer. Later on when his friend Wolfe had risen to the rank of general and was in command of the British forces despatched against the French at Quebec, Harry was invited to become one of his officers and was present at the great engagement when the gallant Wolfe met his death in the hour of victory.

Meanwhile George had taken up the study of law in London uniting with this a practical interest in literary pursuits. He wrote a successful play which the great Doctor Johnson was understood to have seen with approval on its performance. In fact George was cutting something of a figure in the literary society of the time and showed his good sense by falling completely in love with Mistress Theo Lambert whom in due course he married with the some what grudging approval of his mother.

Strangely enough the Lady Maria also married for love an actor who had performed in George Warrington's play having won her heart and although the couple were extremely poor we are to believe they were not unhappy. Another and more important wedding so far as our story is concerned was that of Lord Castlewood with an American heiress Miss Lydia VandenBurch whose wealth did much to restore outwardly at least the fading grandeur of Castlewood.

#### GEORGE WARRINGTON NOW TELLS THE REST OF THE STORY

For the rest of our story we are supposed to read from the papers of George Warrington whose delight in the literary art led him to put on record some of the more interesting episodes in his own career and the lives of his relatives.

In the year following the taking of Quebec Colonel Lambert was appointed Governor general of Jamaica and was to proceed thither with his family. The day after we heard this news Theo and I were privately married lest we should be separated. My mother having written to me before news of my marriage could reach her urging my return to Virginia she was none too well pleased at my conduct in the matter and showed no readiness to help me in the difficulties which I had now to face through lack of funds after discharging the debts incurred by Harry.

My hopes were for the time set upon a new play I was writing, but these were presently doomed to disappointment when the play was produced without success. Meanwhile my Aunt Beatrix had died leaving all her property amounting to more than four thousand pounds to her dear nephew Harry Esmond Warrington of Castlewood in Virginia in affectionate love and remembrance of the name which he bore.

#### GEORGE'S FORTUNES BRIGHTEN AND HE SUCCEEDS TO THE BARONETCY

This money I had forwarded to Virginia before I learned that my mother had ceased to send remittances to me but the death of my young cousin the son of Sir Miles Warrington after whom my own son had been named vastly changed my worldly prospects and if for the time I felt the lack of means I had the knowledge that my future was assured. Indeed it was only in the following year that Sir Miles himself died and I found myself Sir George Warrington baronet of Warrington Manor.

By this time also my brother Harry having seen fit to marry Fanny Mountain the daughter of my mother's companion the favour which my mother had been lavishing on Harry was again diverted in my direction and after a time Maliam Esmond so far softened towards my wife and myself as to invite us to visit her in Virginia. For some little while this was impossible but when General Lambert returned from Jamaica on the death of his wife we left him in charge of Warrington Manor and I set sail.

When we arrived at St. James Esmond's house my mother met us at the door and gave both of us letters from her as we

knelt before her. Concerning a great liking for my dear wife, which was no surprise to me, my mother was presently so entirely amenable to Theo's advice and influence that she relented in her attitude towards my brother's wife and received her in her house at Richmond.

**GEORGE VISITS HIS MOTHER IN AMERICA AND SEES MORE FIGHTING**

The political troubles which had long been brewing between the home Government and the American colonies were now at boiling point. For myself I remained loyal to the British Government, while Harry took the colonial side, though this in no wise weakened our brotherly relationship. When war broke out I saw some service under the British flag but a wound received at the battle of Long Island proving slow of healing, I was led at length to return to my English home, where my elder children had been sent three years earlier.

Before leaving America, however, I had an opportunity of meeting Harry under a flag of truce, in the camp of General Clinton, with whom he was then serving, and the truest of friends and fondest of brothers came with me to the place of parting.

Before the war ended Harry had risen to the rank of general, and afterwards he visited us at Warrington Manor, soon after the death of his wife, whose good qualities he never ceased to praise. It was the fond wish of Theo and myself that he might some day marry Hester, and he did indeed venture at length to propose to her, but she declined to marry so long as her father lived.

I had but little intercourse with Lord Castlewood after I became the master of Warrington Manor, but that nobleman, thanks to the suggestion of his American father-in-law, laid claim to our Virginian estates on the ground that only a life interest in these had been granted by his father to Colonel Esmond, and that it was not intended they should have passed permanently

from the possession of the Castlewoods. His brother William, who had been shot as a spy in America, had been there, I suspect, for the purpose of destroying the proofs of our absolute ownership to the Virginian estates.

At any rate, my mother discovered that the documents had been burned, but fortunately Parson Sampson, whom I met by happy chance, knew of a copy of the assignment which existed at Castlewood, and boldly going thither we got possession of this, and successfully confronted Lord Castlewood with proof of his dishonesty.

That nobleman had coolly offered to let us retain possession of the estates on payment of a greater sum than they were worth, thus showing his baseness. From that day I never again set foot in the historic home of my ancestors.

**SIR GEORGE'S TRANQUIL LIFE AT WARRINGTON MANOR**

At her house in Richmond, Madam Esmond still lives. Shall I ever see the old mother again? When Hal was in England we sent her pictures of both her sons, painted by the admirable Sir Joshua Reynolds.

We have copies of both of these paintings at Warrington Manor, but the picture which my son, Captain Miles, and the girls declare to be most like is a family sketch by my ingenious neighbour, Mr Bunbury, who

has drawn me and my lady with Gumbo following us, and written under the piece, "Sir George, My Lady, and their Master."

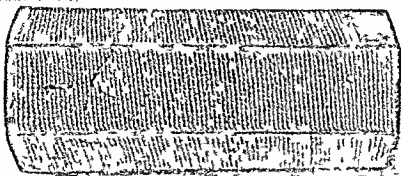
Here my master comes, he has poked out all the house-fires, has looked to all the bolts, has ordered the whole male and female crew to their chambers, and begins to blow my candles out, and says, "Time, Sir George, to go to bed! Twelve o'clock!"

"Bless me! So indeed it is!" And I close my book, and go to my rest, with a blessing on those now around me asleep.

The next stories of Famous Books are on 3473



"Sir George, My Lady, and their Master"



This various clay yll do wldnt do i eally an anle tA sy an h trybook fo Nin h

## HOW MEN LEARNED TO WRITE

Put the letter in the oven to bake please. It would sound funny to hear that said to day would it not? But that is what people would hear when writing was in its infancy. Thousands of years ago the people of Babylonia and Egypt learned to make themselves understood in writing. They invented signs which stood for letters and words and ideas. These signs were sometimes pictures. A picture might stand for a letter or for a name or an article, or for something more. They had to learn to read and write just as we have to. But our manner of reading and writing is a thousand times better than theirs which was the beginning of all reading and writing.

They had no pens or paper. The Palmyranus took soft clay and shaped it into little bricks or tablets. On this they would write what they wished to say using something which might be a piece of a broken pot or part of an oyster shell or something with a square head which would make their wedge shape letters. These characters were impressed upon the soft clay which was then placed in an oven to bake hard or left in the sun to dry. They made their books and letters just like they made their bricks. Men who have dug up ruins in our own time have found old tablets of clay which record business matters that took place nearly 3000 years before the birth of Christ.



For more lasting work like the recording of laws they used metal instrument and with these carved their words on pillars of stone. One of the most wonderful codes of laws in the world—the code of Hammurabi the great king of Babylon who reigned more than 4000 years before Christ—was written on a pillar of rock eight feet high. The laws were carved so perfectly on it that we are able more than 1700 years later to read them.

The Egyptians first wrote on stone but other men of the same nation found that papyrus a plant growing in the valley of the river Nile made a good substance on which to write. They used to scratch the letters on with something very much like a pen or better still write with pen and ink. The ink was generally made from galls and sulphate of iron. The pens they made by cutting reeds, as we used to cut feathers and make them into quill pens. From Egypt use of papyrus in reeds spread by way of Greece into Europe and when the first printing was made in the 15th century the principal substance for writing was still papyrus. The following of Hammurabi conquered Egypt in 1793 and would not use papyrus so they had to use a fine leather made with the skin of the donkey. The word of leather is still used. We call it parchment. Velum is another word for parchment but it is small.

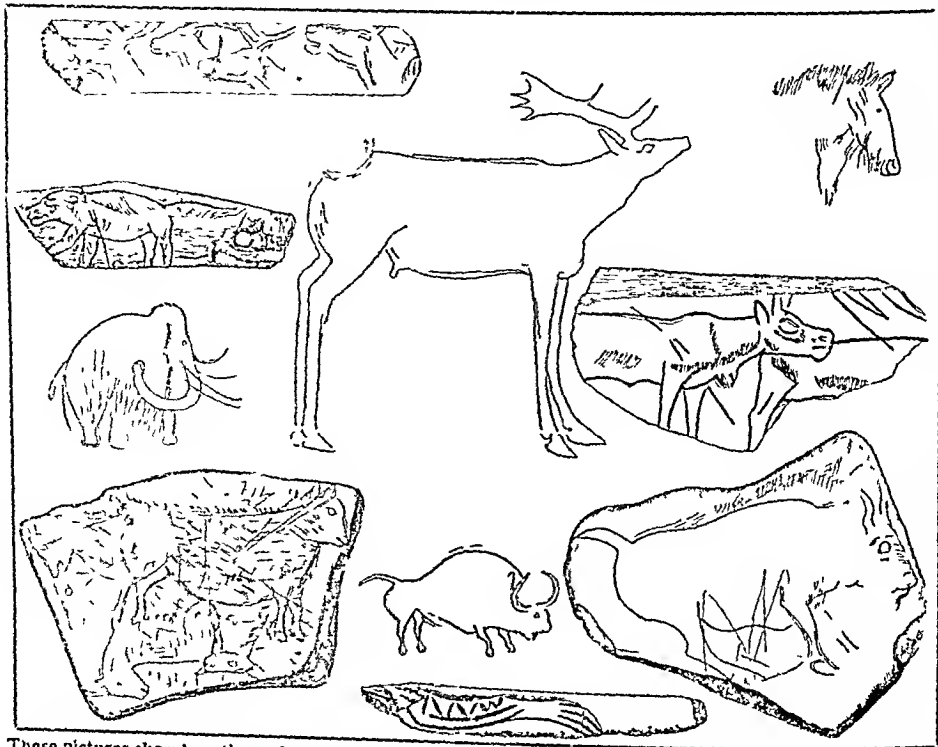


from the leather of younger animals. The Romans used to write on blocks of wood which were covered with wax, on which they could print their letters with a hard point. Nowadays we in this country use the Roman alphabet, but not the Roman way of writing.

The reed pen is still largely used in the East, and it was used in the Western world until the thirteenth century, when quill pens, made from feathers, took its place. The quill lasted until about 1800 when metal pens began to appear on the market. They had been

Until after 1840 even school children used quills, but to-day there are more than 100,000 sorts and sizes of metal pens to choose from. The ordinary pen looks simple enough, but it has to go through sixteen processes before it is finished, while the gold nibs for fountain-pens are not finished till they have been through over forty processes.

Pencils came into use some hundreds of years ago, for they are mentioned in a book which was published in 1565. They are not so important for records as pens, because the lead rubs



These pictures show how the earliest men used to write. They were scratched on bone or rock by prehistoric men, and most of the pictures were found in caves. From pictures, men developed signs for words and letters.

made before, but only as curiosities. Even at the beginning of the nineteenth century they were not soon successful.

People tried to make pens of horn and of tortoiseshell, with pieces of diamond embedded in their points. They also put metal points to quill pens. Nothing much happened until 1820, when James Perry began metal pen making at Manchester. He was very successful, but Sir Josiah Mason was still more so, for he invented a machine which would make metal pens so quickly and cheaply that everybody could obtain them.

out. That is the very fact which made them important for the purpose for which they were needed. Ink cannot be rubbed out, in the ordinary sense. Where it may be necessary several times to rub out words or figures, or lines, especially in drawings, pencil is the very thing required. Would not the ancient Britons, who made their drawings by scratching with flints on the rocks, have liked lead pencil with which to make rough sketches before leaving their work to be seen by generations several thousands of years after them?

# MAKING PENS FROM A BIRD'S FEATHERS



For about 100 years before the 19th century quill pens were made from the feathers of the goose. Now they are made from the feathers of the quail. The quill pens are still made in the same way as they were made 100 years ago.



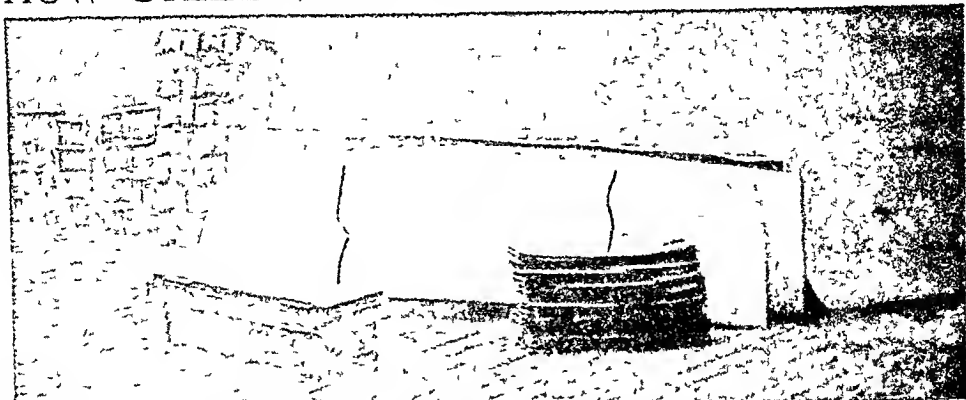
The first process in making quill pens is to clean the quill by heating it in a cup of water as the man in this picture is doing.

They are then carefully examined by a skilled workman, and those suitable for the purpose for which they are intended are put together ready for the calligrapher who uses the pen.

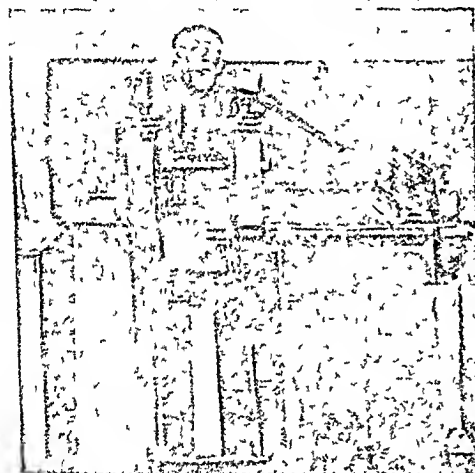


The cutter with a few strokes of his knife produces the finished pen. The quill pens are then tied together in bundles who do this work are very skillful and quick and make bundles ready for the shops. Of course bundles of pens in a very short time without opening any the industry is declining every year.

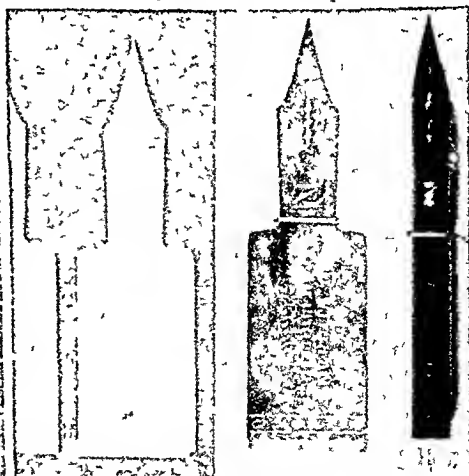
# HOW STEEL PENS AND NIBS ARE MADE



Steel pens go through sixteen processes, some of which are shown on this page. Here we see the steel from which the pens are made, and the annealing pots, or boxes in which strips of the metal are heated and softened.



In these pictures we see the strips of steel being rolled, in readiness for the stamping out of the pen shapes. This rolling process makes the strips of steel uniform in thickness to the ten-thousandth part of an inch.



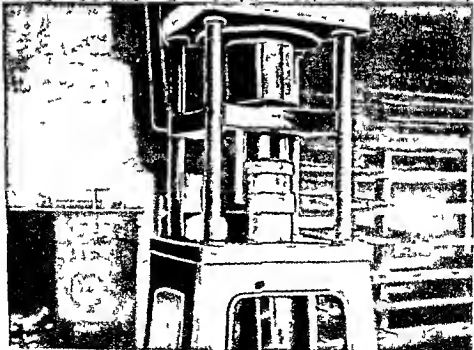
The shapes are stamped out, heated in furnaces, and then put into vats of oil to harden them, as shown here. Here we see the metal, and the shape stamped from it. The pen, quite ready for use, is shown on the right.

The photographs on this page are taken in the factory of Messrs. William Mitchell Ltd.

# HOW WE GET OUR LEAD PENCILS



A lead pencil, while we stupidly call by that name though it contains no lead really made of a material called graphite or plumbago. This lead goes to the earth, a deposit of carbon and other things but not of lead. The plumbago has to be ground up fine in this process and then powdered with water and clay.



After being powdered in bags, it is spread out in a long layer 1/2 inch deep, then passing is forced through a pressing machine. Down the centre of the machine runs a strong 1 in. The plate is driven down 1/2 inch which makes it into long slender sticks. We saw the work of plumbago coming out while the part marked with a black spot on the machine. This is the pencil without its covering of wood which has now to be inserted.

# THE PENCIL IS PUT INTO ITS CRADLE



The wood for the pencil is from the Virginia or Florida cedar-tree, which is soft, has a straight grain, and is easily cut. The tree is cut up into logs, and brought in ships to England. The logs are split into smaller pieces, and then a machine cuts these into long, straight, square strips of wood, all of the same length.



The strips of cedar wood are then passed through a machine which cuts out a groove on the upper side. The grooved pieces of wood are laid on the bench of a man who has a number of pieces of plumbago, or "black-lead," ready. He fills each groove with a piece of this, having first put a little glue on the lead to make it stick in its place. The cradle, with the lead, is now ready to have the other wooden part of the pencil fastened over it.

# THE SQUARE PENCIL IS MADE ROUND



The wood of the pencil is not in two equal parts. That which is grooved to receive the lead is thicker than the other. The second piece is not grooved but is flat. The part containing the plumb goes to a third man and he lays on the flat portion of the wood a delicate glass both together. The result is a square pencil. Another machine is employed to plane the pencil and make them round or flattened and even.



Having been shaped and reduced to the proper thickness the pencils come in long sticks to the workshop, where they are made into pencils and to be sold. They have to be stained and polished to make them pretty as well as to sell. Nobody would like to use a rough ugly-looking pencil, and it is easy to make them neat and pleasant to hold. Some are coloured red, others yellow, brown, or black, and the others are not.

# THE PENCILS ARE READY FOR SCHOOL



All this time the pencils are very long, for it would be a waste of time to make them in short lengths. They are now placed in a little machine, and a man, by pulling a lever, causes a strong blade to come down and cut each long pencil into two, or three, or more, of the right size for using. The process is the same for all pencils.



The only manufacturing process remaining is to stamp upon the pencils the letters showing whether they are hard, hard and black, soft, or soft and black. Then the manufacturer's name is stamped on, and the pencils are made up into bundles of dozens, packed up in boxes, and are ready to go to the shops and the schools.

THE NEXT PICTURES OF FAMILIAR THINGS ARE ON PAGE 3439



Tasked with the fire. From the pen and ink of Wm. Langley R.I.

## WHY DOES THE FIRE GO OUT?

A FIRE or anything else that is burning will go out if the supply of air or oxygen to it is stopped or if that supply is made so scanty that the burning goes on very slowly and so does not produce enough heat to keep the coal or whatever is burning at the temperature at which it is capable of combining with oxygen or a fire or anything else will go out when there is nothing more left to burn. When a fire goes out in the ordinary way there is still plenty of burnable stuff left in the grate and there is still plenty of air in the room of course but there is not a good enough draught up the chimney and the air of the room is not getting to the coal of the fire quickly enough. The air enters the fire almost entirely from below but perhaps there are many a hole in the grate choking up the spaces between the bars and the air cannot get to the coal. So the fire dies of suffocation it cannot get air. If we clear away the ash's the fire goes on burning.

**HOW CAN THE FIRE IN THE CENTRE OF THE EARTH BURN WITHOUT AIR?**

Almost everyone is puzzled by the two different ways in which a thing may give out heat and light. A thing does this when it is hot but it may be hot either because it is burning or for some other reason. The fire is

hot because it is burning and that is why it gives out heat and light. The thread in an electric lamp gives out heat and light because it is hot but it is hot not because it is burning but because it is made hot by electricity passing through it. The sun gives out heat and light because it is hot but the sun is not burning. The sun is actually so hot that oxygen cannot combine with the other elements of the sun. The sun's heat is entirely due to other causes. Similarly the centre of the earth is like a fire since it gives out a great quantity of heat but it is unlike a fire in that it is not burning, any more than the sun is or the thread in an electric lamp. We should use the word glowing and then we can say that the sun and the inside of the earth are glowing though they are not burning. The current through an electric lamp makes the thread glow though it does not burn. A fire and many other things glow when they burn because the burning makes the things so hot that they glow. Any body of matter that is made hot enough will glow that is to say will give out light and heat. The proper way of saying the matter is that a body will glow if it is hot enough to give off rays of light and heat.



## WHY HAS THE EARTH NO LIGHT OF ITS OWN LIKE THE SUN?

There is no doubt that the earth had a night of its own long ago and this thoughtful question very rightly suggests that the other planets, too, must surely have had a light of their own at one time, just as the sun has, because the sun and the planets were all made from the same hot cloud, or *nebula*. Now the question we have to answer is why the earth should have become cool, while the sun still remains hot, so that it can no longer give out any light of its own but can only reflect the sun's light. The reason is that the smaller a thing is, the more quickly does it lose its heat. The heat escapes from the surface, and the smaller a thing is, the larger is its surface in proportion to the amount of stuff in it. If we go to a place where people are making glass, and get them to make us three or four balls of glass of very different sizes, we shall find that the little one is quite cool when the biggest one is still far too hot for us to touch it.

A baby needs warmer clothing than a grown-up person, and small and thin people need more clothing than large people, because they have such large surfaces to lose their heat by in proportion to the mass of their bodies. As regards the solar system, we can learn especially from the moon and from Jupiter. The only reason why the moon should have become so much cooler than the earth, though it is made of the same stuff, is that it is so much smaller. On the other hand, Jupiter is very large, and astronomers are almost sure that the giant planet is still hot enough to give out some light of its own.

## WHY DOES OIL BURN SO EASILY?

Oil is a word covering a great many things, but though these things differ in many ways—in taste and colour and smell, and in their chemical composition—yet all oils agree in consisting of a very large amount of the two elements carbon and hydrogen. Many oils contain a certain amount of oxygen, but no oils contain nearly enough oxygen to satisfy the carbon and hydrogen atoms in them. If hydrogen is to be fully burnt, every two atoms of it need one of oxygen, as in water,  $H_2O$ . If carbon is to be fully burnt, every atom of it needs two atoms of oxygen, as in carbonic acid,  $CO_2$ . No oil contains

anything like this proportion of oxygen to the carbon and hydrogen in it, and so all oils are capable of being burnt, that is to say, of being made to combine with oxygen—and they will go on burning until all the carbon and hydrogen in them have combined with all the oxygen they are capable of combining with; and then when the oil is completely oxidised it is completely burnt, and cannot possibly burn any more.

## IS IT BAD TO SLEEP WITH THE MOON SHINING ON US?

It is not bad to sleep with the moon shining on us, but it is very bad to believe nonsense. Every night that the moon shines, millions of animals sleep with it shining upon them, and if anyone fancies that it is bad for human beings to sleep out of doors, whether the moon is shining or not, he makes a great mistake. All notions of this kind are really remnants of the old astrology, which ascribed all sorts of influences to the heavenly bodies, and thought that lunacy—the word came from the Latin *luna*, meaning the moon—was caused by the moon. Moonlight is only reflected sunlight, and, though it is very feeble in proportion to its brilliance, it is valuable, just as sunlight is.

## WHY IS IT DANGEROUS TO SLEEP IN A DAMP BED?

One of the greatest facts about water is the enormous amount of heat which it can hold, and the very great quickness with which it can take heat from anything else—in other words, it has a great capacity for heat, and it is a very good conductor of heat. When we sleep in a damp bed, then, the water in the sheets or blankets rapidly takes a large quantity of heat from our bodies—far more than dry sheets or blankets are capable of taking. This means that the temperature of our bodies is lowered because heat is taken from them more quickly than we can make it up by our burning. But if the temperature of the body and of the blood is lowered, its power of resistance to all sorts of microbes, such as those which cause pneumonia or inflammation of the lungs, and those which cause rheumatic fever, is also lowered. And so we are very liable to get any of these diseases, or influenza, or bronchitis, or a common cold, or some others. If we think that the sheets on a bed are damp, we should take

HOW DO WE KNOW WE HAVE DREAMED WHEN WE ARE AWAKE?

After all, this question, when we come to think of it, is only one regarding memory. We remember some of our dreams. A dream is an experience of a special kind, it is something happening in the part of our brain which has to do with consciousness and experience, and the brain's general power of memory applies to this as it does to other cases. But, of course, the brain is in a peculiar state when we dream. The whole of it is not working, and so our recollection of dreams is, as a rule, not nearly so good as that of our waking experiences.

The more clearly we remember a dream, the greater must have been the part of the brain machine that was working at the time, and, on the other hand, there is no doubt that we have many dreams which we do not remember at all when we wake, and which were due to the working of only a very small part of the brain. We see from this that we can judge which dreams are the best kind to have, if we are to have any. The more definite a dream is, the more vivid it is, and the better we remember it. The more awake our brain was when we dreamed, the poorer and less valuable was our sleep. But when a dream is scarcely remembered, or not remembered at all, and when it is very faint and vague, then our brain was much less awake during the dream and our rest and sleep were so much the less injured.

WHAT DO THE WORDS ROUND A PENNY MEAN?

The words round the penny are written in Latin, which was once the language of scholars everywhere. Most of the words have to be written short to save room, and those that are so written have two dots after them. *Edwardus* is simply the Latin form of Edward, *Dei* means "of God," and *gra* is short for a Latin word, meaning "by grace." The next three words mean King of all the Britains—we know that *rex* means "king," and *omni* in English words always means all, as in *omnibus*, which means "for all"—*fid def* means "Defender of the Faith," and the last two words, which we shall not find on pennies of fifty years ago, mean "Emperor of India." So that the whole inscription on a penny means "Edward the VII by the Grace of

God, King of all the Britains, Defender of the Faith, and Emperor of India." I have a penny in my pocket dated 1866, on which the inscription ends with the words "F. D.," short for Defender of the Faith, but at that time Queen Victoria had not been proclaimed Empress of India, and so "Ind. Imp" is not there. If we look at coins of earlier reigns, we see that the inscription varies a little. Sometimes, for instance, the *omni* is missed out, and there is simply "*Britanniar.*"

DO WE SEE A THING IMMEDIATELY WE LOOK AT IT?

Certainly not. Seeing, and every other kind of sensation, take time. From the instant that the light strikes the curtain at the back of our eyes to the instant that we see is quite a long time compared with some things—for instance, compared with the time it takes light to travel a mile. We are apt to think a second the shortest part of time that is worth mentioning, but that is absurd. A second is a period of time so long that light, radiant heat, and electricity could travel almost as far as the moon in such a time. The really wonderful thing about seeing is, that it takes such a small fraction of a second for all the things to happen which are necessary before we can see. Complicated chemical changes have to take place in the living cells of the curtain at the back of the eye. These changes have to produce special nerve currents, which in some amazing way correspond exactly to them, and these run along the eye nerves—first to a group of cells in the lower part of the brain, and then from them, along another set of nerves, to the real eyes—a group of nerve-cells at the very back of the brain, which themselves have developed, and have always lived, in utter darkness. Something happens in them, and then we say we see. The marvel is that only a few hundredths of a second are needed for all this that has been described to happen.

WHY, WHEN WE HOLD A LUMP OF BEET SUGAR TO THE GAS, DO RED DROPS COME?

I think I would call these drops brownish rather than red, said the Wise Man, and if we try the experiment with a lump of cane sugar, I do not think we shall find much difference. We shall notice that this stuff in the brown sugar has rather a nice smell, and indeed it helps to make very nice

sweetmeats Sugar is a very complicated chemical substance containing carbon hydrogen and oxygen. When it is completely burnt of course it is all turned into water and carbonic acid but when we put a match to it or hold it in the gas it is only partly burnt in other words the process of combining it with oxygen only goes part of the way and so we get a number of oxidation products as they are called which contain more oxygen than sugar does but much less in proportion than carbonic acid and water. So if we could go on oxidising or burning the sugar in the end we should oxidise or burn away this brownish red stuff completely into water and carbonic acid.

WHY ARE DARK THINGS WARMER THAN LIGHT THINGS?

We can answer this question at once if we know the answer to the question.

Why are dark things dark? A thing is dark even in the light because instead of reflecting, or throwing back the light from its surface it keeps the light or as we say absorbs it. Light and radiant heat are really the same thing and as a rule anything which absorbs or reflects the one absorbs or reflects the other. So light clothes throw back from their surface the light and the heat that strike them. Probably nothing will throw back all the light and heat that strike it and even the whitest snow will melt under the sun's rays. But while light things keep only a little of the light and heat that fall on them dark things absorb practically the whole and so of course they get warm. Thus a suit of white flannel for instance will become really warmer to wear if it is simply dyed black.

HOW MANY MILLS IS THE SKY HIGH?

What we call the sky is nothing but the appearance of blue that we get in a bright day owing to the fact that particles in the air reflect the blue part of sunlight to our eyes. When we see the blue sky then what we really see is air. The height of the particles that reflect this blue light to our eyes is not very great. It is perhaps fifty or sixty miles at the most and compared with the size of the universe that is nothing at all. But by the sky we may mean not the blue sky of daytime but the great space around us

that we may see on any bright night. We see vastly farther then than in the daytime because we can see right through the air out to the farthest light in the daytime the sun is lighting up all the air around us so that though we seem to see a long way we really cannot see past the lit up air—except when there is something very bright beyond it such as the sun itself and sometimes even the moon. **DO WE KNOW HOW FAR THE SKY REALLY GOES?**

If we study the distance of the stars that in itself of course teaches us something as to how far the sky really goes. But when we have learnt the enormous distances of some of the stars which we can see—distances so great that there is no space to write them in miles and so we have to speak of light years meaning the distance that light travels through in a year—even then we have not begun to say how far the sky goes. If we had a telescope a million times bigger than the biggest we have and then could find with it the farthest star that it would reveal we should even then be no nearer the end of the sky than we are now for there is no end to it. If we travelled out in a straight line through the sky for ever we should never reach the end of it. That is what we mean when we say that space is infinite which is simply the Latin word for unending.

WHY DO THE HILLS LOOK BLUE AT A DISTANCE?

The blueness of the sky is due to the blueness of the air which looks blue to us because tiny specks of matter floating in it reflect the blue rays of sunlight to our eyes. Now if we look through a layer of anything that is coloured at something beyond it the layer will contribute its own colour to the colour we see. The blueness of the air however is a very faint blue and we do not usually notice the blueness it contributes to a thing. But when we look at distant hills we are looking through such a thick layer of air that it gives them a blueness. But the actual colour which we see depends upon many other things—for instance the colour of the hills themselves and the colour of the sky which is the shade at which the sun is shining upon the hills and also affects the colour of the sun itself. That is enough to explain why the colour of hills is so variable and also arises from our want to know.

## IS THERE ANY WATER IN THE SUN?

We are quite certain that there is no water in the sun. We know that both oxygen and hydrogen exist in the sun, just as they do in the earth, and we cannot doubt that, as they have a great attraction for each other here to form water, they must have a great attraction for each other there. Yet there can be no water in the sun, because the sun is so hot that none of the elements—not even oxygen and hydrogen, can combine with each other there. By producing intense heat, we can force the oxygen and hydrogen of water apart, and that is what happens in the sun—or, rather, the sun has never been cool enough to allow them to come together.

## IS THERE ANY WATER ANYWHERE EXCEPT IN OUR WORLD?

Oxygen and hydrogen, which, when combined, form water, are found wherever we look for them through the universe. In the case of our own solar system, we can prove that, wherever the temperature is not too high, there oxygen and hydrogen, if found together, will combine to form water. That is true of our own earth, but, as we have seen, the sun's temperature is too high for it to be true of the sun. We should expect some of the other planets besides the earth to be cool enough for water to be formed, and in the case of the planet we know best, which is Mars, this is so. We have known for several years that something, which looked and behaved exactly like water, gathered at the North Pole and South Pole of Mars, forming caps of what looked like ice, that increased or decreased at each Pole according to its winter or summer. We also see occasional, but very rare, clouds in the atmosphere of Mars. Many people, however, said that the Polar caps of Mars were not made of water, but of solid carbonic acid, which looks like snow, but it has quite lately been proved that what looks like water on Mars is water, and so this very important question is answered.

## WHERE DOES THE SEA-WATER GO TO AT LOW TIDE?

The shortest answer to this would be that, at low tide, the water goes to the places where it is high tide. As the earth spins under the pull of the moon and the sun, the water is always being moved about. Of course, it is always somewhere, and if it is not in one place,

it must be in another. When it is pulled to one part of the earth and heaped up there, that makes high tide. As we watch the tide rising, what we see is the water being heaped up in our neighbourhood, mainly under the influence of the moon. But if it is heaped up there, it is being drawn away from somewhere else, and that somewhere else is the place where the tide is ebbing. No tide rises but some other tide falls.

## WHY DOES IRON FEEL COLDER THAN WOOD?

Our feeling whether anything is hot or cold does not depend wholly upon how hot or cold the thing really is. The marble on the washstand and the towel beside it are both of the same temperature, but the marble feels much colder than the towel. All the parts of a hammer are at the same temperature—unless, of course, one end of it has been heated—and yet the iron head feels much colder than the wooden handle. In all these cases the thing we feel is colder than our skin as a rule, and so heat will flow from our skin into the thing. Our feeling entirely depends on the rate at which the thing takes heat from our fingers. Marble and iron take heat quickly from our fingers, they quickly make our fingers cold, and so we say that they are cold, meaning really that they make us cold.

But wood and cotton do not take heat away nearly so quickly from anything warmer than themselves, and so we say that they are not so cold. Really we should say that marble and iron are good conductors of heat, but wood and cotton are bad conductors of heat.

## WHY DO DARK THINGS LOOK SMALLER THAN LIGHT THINGS?

When we see a dark thing against a light background or a light thing against a dark background, it is really, of course, only the light that we see. We see a perfectly dark thing only by contrast with the light around it, and if the light around it were not there, we could not see it at all. We cannot see darkness. Now, it is an interesting fact about the eye, which it is not difficult to understand, that when any part of it is excited by light, the effect of the light spreads a little all round the edge of the part of the eye on which the light falls. It is as if the little light at the edge of it radiated sideways, and so it is called *irradiation*.

Now when we see a black spot like a blot of ink on a piece of white paper irradiation works in the eye of course so as to make that spot appear smaller than it really is for all round the edge of the part of the eye which is opposite the spot and on which the light is not falling a little of the effect of the light from the white paper is being felt. When we see a white spot on a dark background irradiation works outwards from the white spot into the part of the eye which is really opposite the dark and so the white spot looks bigger than it really is.

**WHY ARE SOME PLANTS POISONOUS?**

When we say a thing is poisonous we mean that it is poisonous to us. Some things which are poisonous to us are poisonous to all living creatures but most things are poisonous to some creatures and not to others indeed they may be very good for the others just as when we say one man's meat is another man's poison. So long as we have the old idea that every living creature exists for our benefit it is indeed a puzzle why some plants should be poisonous why some snakes should be poisonous why there should be disease-causing microbes or why tigers should have claws. But if we understand that every living creature exists for its own sake then we shall look at the claws of the tiger or the poison of the snake or plant and ask: How do they serve the life of the creature that has them? We are only now beginning to learn the meaning and the uses of the various chemical compounds poisons and others which we find in plants. Some of them seem to be waste products that the plant is gradually getting rid of or sometimes the poisons of a plant act to warn off insects or other forms of life which would injure the plant.

**WHY DOES IT THUNDER AND WHICH SIDE OF THE CLOUDS IS THE THUNDER ON?**

Thunder is a noise in irregular wave in the air. Its cause is the very sudden heating of the air high up above our heads by the quick passage of electricity through it from cloud to cloud or from a cloud to the earth. Air offers great resistance to the passage of electricity through it and when anything resists the passage of electricity that thing becomes hot. If it

becomes hot it expands suddenly and so it starts the air wave we call thunder. A sound—and the same is true of a light made at any place—spreads out if it can quite equally in every direction. So the sound of the thunder spreads upwards from the cloud, downwards from the clouds and sideways through the air and through the clouds themselves. The part we hear is of course the part that reaches our ears, part of the wave that spreads downwards from the place where the electricity passed and started it.

**HOW LONG DO MICROBES LIVE?**

The answer to this question is one of the most extraordinary facts in the world. Of course a microbe like any thing else may be killed because it is poisoned or crushed or made too hot or because the water is taken out of it or most commonly of all because it cannot get enough food. But when we ask this question about microbes we mean: How long do microbes live naturally? And the answer is that *microbes do not die*. The natural end of the life of a microbe and of other living creatures like the microbe which consist of only one cell is not to die but to divide into two pieces each of which grows and becomes a new microbe as we see in the pictures on page 54. That is the very simple way in which the race of microbes goes on. If the whole body of a living thing divides into two parts which become two living things each of which does the same in its turn then we cannot say that in such a case death happens at all. Many a book might be written in all that this means when we compare it with the other kinds of life with which we are so familiar.

**WHAT IS THE SHORTEST LIFE IN THE WORLD?**

Microbes and many other creatures belong to a group of plants with a special name that means the plants that split because they split into two so as to form new members. From the moment that a microbe has put until its two halves, having grown themselves apart in their turn—we may call the length of a microbe's life. It is the shortest life in the world. The microbe that causes a certain disease splits into two after about two days, and then each new one from the original one splits into two and so on.

the microbe that went before it. One microbe in twenty-four hours has been found to multiply into eighty thousand. But we must of course understand that the rate at which microbes grow, and split, and so multiply, depends upon conditions and especially upon the food supply. If there is not enough food, or if there is a tiny quantity of some antiseptic perhaps, such as carbolic acid, the microbes may remain for a long time without splitting, or they may be killed.

WHY DO NOT ORANGES GROW IN ENGLAND?

Every kind of living creature has certain conditions in which it is fitted to live, certain places which it inhabits. So we use a special word, and say that the sea is the *habitat* of the fish, England of oaks, Spain of oranges, and so on. Some creatures can live in a greater variety of conditions than others. We know only one creature that can keep himself alive in any part of the world, and that is man. But even he lives and works best neither in the tropics nor in very cold countries. Of all the conditions which affect the growth of living things perhaps the temperature is the most definite. Thus, when we go up a high mountain in a warm country, we can find, as we go upwards, different kinds of plant life, each corresponding to the different levels of the mountain as it is higher and colder. The orange tree is one which requires a hotter average temperature of the air than we have in England; though by no means the very hottest to be found anywhere. So if we alter this one condition of temperature, we can make the orange tree grow in England quite well, as we have on any day at Kew Garden.

WHEN WATER IS BOILING, WHY CAN IT NOT BE MADE HOTTER?

When water is boiling it can be made hotter, but not as liquid water. Water, however, has a certain temperature above which it cannot be a liquid. It is 212° F., and below which it is not a liquid, but must be a liquid. But we can call the temperature at which water boils the boiling point. We can of course make water hotter than its boiling point, when it is in the form of a gas, or steam. But when it is a liquid, it cannot be made hotter than its boiling point.

If we go on boiling water, we are certainly putting heat into it, and we must not fancy that because the liquid water gets no hotter, the heat is being lost, or wasted, or turned into nothing. Nothing is ever lost, or turned into nothing. What the heat does is to put itself into the liquid water, so that that liquid water takes the form of a gas, and the heat still remains, though rather changed, in the energy of movement of the parts of the gas. We can easily prove that the heat is doing something, though it is not making the water hotter, when we find that if we go on boiling we boil all the water away; that is to say, we turn the whole of it into water-vapour.

WHY DO WE SOMETIMES SAY "GAS" AND SOMETIMES "VAPOUR"?

It is a pity to have two words for the same thing, when they confuse people. You and I said the Wise Man, are rather apt to think of a vapour as something in the air that we can see; that is to say, something that we cannot see through. But a vapour is really a gas, and a gas is a vapour. Only when a thing at ordinary temperatures is usually gaseous do we call it a gas. When we know a thing best as a liquid or a solid, such as water, we call its gaseous form a vapour. So a vapour is simply a gas, or the gaseous form of a thing that we know best as a liquid or a solid.

WHY DOES BOILING WATER FEEL LIKE COLD WHEN WE PUT OUR HANDS IN IT?

Though we can gain no knowledge except through our senses we know that they are very apt to deceive us; and the general rule about this is, that the senses deceive us least when they are concerned with something we are accustomed to; but they deceive us most when there is something unusual about the thing we are feeling or seeing. Another general rule is, that the senses are apt to deceive us when they are being excited very intensely. They work best with things they are accustomed to, and with things that excite them neither very little nor very much. In the skin of the hand, there are special arrangements for feeling both hot and cold, and it is a very interesting fact that, as the sensation points out, when the sensation of heat is extremely acute, the sensation of cold is at the same time, at least, very acute. When we were touching

something very cold. But no one can explain how this mistake comes about only this question is well worth thinking about and storing away in our minds with other instances of the mistakes that our senses make

#### HOW DO CLOUDS STOP SUNLIGHT IF THEY ARE PURE WATER?

In all its forms water stops and takes into itself a certain amount of the light of the sun. We know that liquid water does this for it very soon becomes darker as we go down through it. Solid water or ice does so too. Gaseous water does so least and the gaseous water which is always present as part of the air does not stop enough of the sun's light for us to notice. But water in the form of round drops suspended in the air which is what clouds are really made of can stop a great deal of the sunlight.

We can understand this at once if we remember what a soap bubble looks like. Here is a bubble made mostly of water. It has a beautifully bright and glittering surface. That means that the light falling upon it is very largely thrown back from its surface. So if there is a cloud made of millions of tiny bubbles or drops—which are also glittering things—it will throw back a great deal of the light that falls upon it. We can understand this when we see the lighted side of a cloud. Nothing could be more brilliantly and perfectly white than the clouds like snow mountains which we often see. They are white and bright just because they do not allow the sun's light to pass through them but reflect or throw it back from themselves.

#### WHY CAN WE HEAR THE SCRATCHING OF A PIN AT THE OTHER END OF A POLE?

Sound is made of waves in matter. Waves of a certain kind and rate which our ears can hear. Any kind of matter may be thrown into these waves and so may convey sound. The thing that conveys the sound and in which the waves are is called the medium which really makes the thing, in other words, the commonest medium for sound in our case is the air. In the case of pipes of course it is the water. But many other things convey sound waves extremely well and when we scratch one end of a long pole with a pin the matter of which

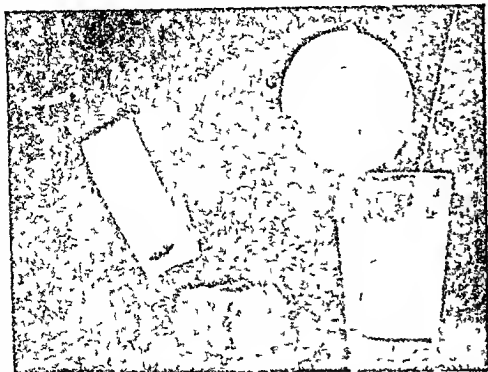
the pole is made is thrown into a series of waves that go on as long as the pin continues to move and that we can readily hear through our ear or perhaps even by merely putting our end of the pole against the side of our head or against our teeth. But the ear is best because it contains special arrangements for conveying sound waves to the real ear inside our head much better than the bones of the skull or face can do. We have all heard stories of how Red Indians can hear sound at great distances by putting their ears to the ground and this shows us that the earth may convey sound waves—that is to say waves which our ears can feel and appreciate as sound just as well as air or water or a pole.

#### WHY DID THE PEOPLE OF LONG AGO LIVE LONGER THAN THE PEOPLE OF TO DAY?

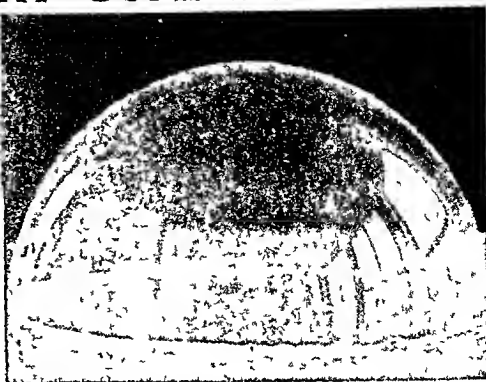
Altho before answering this question there is another question that must be asked first. Did people who lived long ago live longer than people do now? And I have no doubt at all that the answer to that is No. In all sorts of old records we are told that people lived to great ages but there are many ways in which this can be explained. One of them is that there were different ways of reckoning age in those days. All the real evidence that we can get from the study of the past and from our knowledge of ourselves and peoples now living on the earth shows us quite definitely that the average duration of human life is increasing. The expectation of life as it is called of the people who live in England now is definitely larger than it was twenty or even ten years ago and far larger than it was a hundred years ago.

Perhaps we have noticed that when human beings are children there is a time when they can hardly distinguish between facts and the sort of things they have imagined. Just in the same way when mankind was younger than it is now historians make but too many mistakes with any care to deceive but only because in their own minds they could not keep the two things strictly apart. Many of the stories now read with a shudder down and keep us, but a little while we must remember how stupid we were when we were children and how much of the past

# WHAT TO DO WITH SOAP-BUBBLES



Beautiful results can be obtained from soap-bubbles. We must first make a strong lather by rubbing a piece of best yellow soap in water, skim off the mass of suds from the surface, and pour the solution into a tumbler as here shown. The solution must not be stirred.



Next we should smear a little of the solution upon a sheet of glass, and blow a bubble through a thin straw. Then, dipping our finger into the solution, we must try to put it right through the side of the bubble. If we can do this without bursting it, the solution is ready.



It is now quite easy to blow a great number of bubbles, one inside the other, on a sheet of glass, as shown in the picture. For each bubble the straw should be dipped right into the solution, for if any portion of the straw is dry, it will burst the bubbles when it touches them.



Now let us smear a glass, and also an ordinary funnel, with solution, put the funnel over a little vase, and blow down the funnel, slightly raising it while doing so, until a bubble is formed. Then placing a finger on the top of the funnel, we can turn it over until the bubble is free.



Here we see the result of the last action, this beautiful little vase is standing on a sheet of glass completely inside a bubble. Little model houses and toys can be placed inside a bubble by the funnel, in the same way.



We can make a bubble cling to a flower by first putting the flower in the solution, and then blowing a bubble through the straw on to it. Bubbles can be made to cling to most objects that have been dipped in the solution.



## THINGS TO MAKE AND THINGS TO DO



# HOW TO MAKE A TOY SUBMARINE

Most boys have either seen a real torpedo boat or have seen a picture of one dashing over the sea. They are wonderful little ships that travel almost as fast as an ordinary railway train—twice as fast as the great men of war that they are intended to destroy. They dash out at a speed of nearly forty miles an hour towards the great ships, and when they are quite close they fire one of their deadly torpedoes they carry, and the torpedo swims under water like a fish until it strikes the big battle ship. Then it explodes and blows a huge hole in the side of the ship. One torpedo would sink the biggest ship ever built if it struck the hull under the water line.

But there are even more wonderful boats than these. They are the submarines—the little torpedo boats that swim entirely under water so that no ship can see them coming. They can dive deep down out of sight and fire their torpedoes while they are almost under the bottom of the great battleships.

Perhaps it has never occurred to you that you might make a model submarine that would swim under water just like the real ones. Yet you will not find it difficult if you read this description first, and when you have completed it you will find it one of the most fascinating things you have ever had.

You can make it swim in a bath or a small pond. It will dive under water and travel twenty or thirty yards before it comes up again. With your submarine torpedo boat you can play at a naval battle with your friends who have ordinary wooden boats that float. The floating boat will represent the men of war and you will try to make your submarine swim under the water and hit them. If it catches a boat you must remember that at sea, instead of that, what would happen in real war if

a submarine got close enough. Now let us see how to make it.

First you must get a piece of wood about eight inches long, an inch two and a half inches thick. A piece of curtain pole will do splendidly if you can find one that is made of soft wood. With a sharp knife you must cut the two ends to rather sharp points. When this is done your piece of wood will look like a big cigar. The end should be rubbed with sand paper till perfectly even.

Now you must drill a hole from one end of the wood to the other. This can be done with a long gimlet. You can bore from each end till there is a hole right through.

Next you must buy a push button from a toy shop—it will cost one half penny—and with a file you must cut off two pieces about one inch long. You must make the

little rather lighter at each end of the wood and let in the eyes of your shoemaker. Each piece should project a little so you can see in the illustration that I have given.



The hull has to be complete. The letters mark: a, Conning tower; b, turned in the keel; c, propeller; lead keel; d, hand.

Now you must make the propeller of screw that will fit in the allen key. This will be quite easy. You have only to knock the bolt out of an allen key or screw bit and cut it to the shape shown in picture 2. The two halves of the propeller should be twisted slightly like the propeller of a motor.

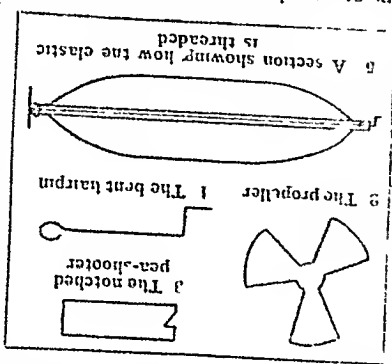
Now drill two small holes in the center of the propeller and fit a piece of wire through them—the sort of wire that is used for catgut. It should be a lead rather larger than the wire that is used for catgut and thread the lead through the two holes in the propeller so that the lead passes the hole in the center of the wood.

Now at the other end of the wood you must make a hole for the lead to pass through. Then take a little of the lead and push it into the hole so that it is in the center of the wood.

rather tight, hook it on to the handle as in 5, and then the mechanical part is done. If you hold the propeller still and turn the handle at the other end the elastic will be twisted up tightly. Then when you release the propeller, it will buzz round quickly and of course, when you put your ship in the water, it will drive it along.

But at present your boat will float. To overcome this you must get a piece of lead tubing. This should be bent round it and lead along the wood to form a keel. It is of the right weight if, when you put your boat in the water, only just the top shows above the surface. To make it drive you must add "fins" to it. These fins are easily cut out of tin and they must be put on with a slight tilt, as shown in picture 1. A straight fin" at the bottom will make it complete.

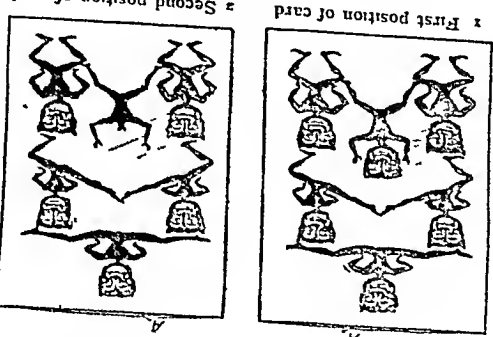
Now wind the elastic tightly, holding the



go. At first your submarine will try to rise, but the fins will keep it below the surface, and it will dart along through the water just like a fish. If you want it to look particularly smart you can make a "conning tower" out of a piece of wood and fix it to the top. When you have tried it and made sure that it travels well, give it a coat of grey paint, and then it will look just like one of the real submarine boats of which you have heard so much. If you use it in a pond you need not fear you will lose it, because it will stay under water only so long as the propeller is revolving. When the propeller stops the boat floats to the top of the pond.

## THE IMP WITH A DISAPPEARING HEAD

The apparatus for this trick consists of a card measuring about four inches by three inches, representing six littleimps, as shown in picture 1. You explain to the company that this card represents the celebrated troupe of Hikkakorum, acrobats giving their marvellous performance. "You will notice their littlelous performace" "I will now show you their great feat, which you will find even more worthy of admiration. I will pick off the head of the single gentleman just below them. If you have good sight, and watch them carefully, you will see their legs move." Holding the card between the second finger and the thumb, the picture side facing the company, you give it a quick wave from right to left and back again. The spectators will not see the legs move, though some of them will probably persuade themselves they did so, but, anyhow, there is "no deception" as to the man indicated has miraculously vanished, and the picture appears now as shown in 2. Of course, it would not do to leave the unfortunate imp in this headless condition. You explain that his head has been kicked up into the air, where it is still floating somewhere. "I will endeavour to catch it for



round the edges. Between them works a little lever of shell brass, with its outer end projecting at the top of the picture, as shown at A. The "head" is movable, working on three bits of fine white horse-hair, as indicated by the dotted lines. These are, by artificial light, imperceptible at a few feet distance. When A is as shown in picture 1, the head is in its normal position, but if A be pushed over, the lower left-hand corner, which it exactly covers, and so has apparently disappeared off the card. The working of the trick will now scarcely need explanation. Under cover of the sideways movement the performer shifts the lever to the position shown in picture 2, and the head is gone. Under cover of the vertical movement he shifts it back again, and the head returns to its original position. The cost of the card, from almost any conjuining shop, is usually about 1/6.

# WHAT IS WRONG IN THESE PICTURES?



There is something wrong in each of these pictures. It will help us to cultivate our powers of observation to try to discover the mistakes the artist has purposely made. They are pointed out on page 1118.

# CURIOUS THINGS ABOUT THE ALPHABET

WHEN first we went to school and learned our A B C we did not think it at all interesting. But there are many things about the alphabet which are very curious and very interesting indeed. For instance, it we were given a set of A B C blocks, and were asked in how many different ways we could arrange them, we might, perhaps, say that we could place them in two or three hundred different ways. But if we said thousands, or even millions, we should be hopelessly under-estimating the possible number of changes.

A great authority on the alphabet, Professor Max Muller, has pointed out that if we take only 24 letters, which is the number contained in the alphabets of many nations, these letters can be arranged in 620,448,401,733,239,439,360,000 different ways. It is, of course, quite impossible for us to grasp what these enormous figures mean, but let us put it in another way. Suppose we wanted to have all these different arrangements of the alphabet written out, and we set all the people of all the world to work, writing at the rate of forty pages a day, with forty sets of letters on each page, they could not complete the work in a thousand million years!

## AN ALPHABET WITH 214 LETTERS

The letters of the alphabet appear practically in the same order in nearly all languages, but how they came to be in this order nobody knows. The number of letters in the alphabets of different languages varies considerably. English and German have 26 letters, French, 25, Spanish, 27; Italian, 20, Russian, 36; Greek, 24, Latin and Hebrew, 22, Celtic, 17, Arabic, 28, Persian, 31; Turkish, 28, Sanskrit, 44, and Chinese most of all, 214.

Of course, in all languages the alphabet is imperfect, and various letters have to stand for more than one sound each. In our own English language, for instance, it is estimated that there are 42 sounds, and only 26 letters to represent them. Even then some of the letters, or signs, are only repetitions of others, as C, which could always be represented by either K or S. Ch, on the other hand, has no letter to represent its sound, which has nothing to do with C or H.

Referring to the myriad ways in which the letters of the alphabet may be transposed, all the words of all the languages, of course, consist of arrangements and rearrangements of a greater or smaller number of these few letters. Martin Luther tells us a story of a lazy monk who, instead of saying his prayers, used to repeat the alphabet and then ask that Providence would put the letters together to form suitable words.

## THE ALPHABET IN ONE VERSE

There is one verse in the Bible that contains all the letters of the alphabet except J, which was originally the same letter as I. It is found in Ezra vii, 21, and the little used letters X and Z are found in the names Artaxerxes and Ezra. Two English words, contain all the vowels in the alphabet in their right order—facious and abstemious. At

least eighteen other words contain all the vowels, although in these they are not in their proper order. Authoritative, disadvantageous, encouraging, efficacious, instantaneous, importunate, mendacious, nefarious, objectionable, precarious, pertinacious, sacrilegious, simultaneous, tenacious, unintentional, unequivocal, undiscoverable, venacious.

There is very much that is interesting about the separate letters of the alphabet. E has been described as

The beginning of eternity,  
The end of time and space,  
The beginning of every end,  
And the end of every place.

## A BADLY TREATED LETTER

The letter H has always been a difficulty with people who have not had the advantages of education, and the cockney habit of leaving it out when pronouncing words in which H should be sounded, and putting it in where it does not exist, has given rise to the following amusing protest of the letter H.

Whereas by you I have been driven  
From 'ouse, from 'ome, from 'ope, from 'eaven,  
And placed by your most learned society  
In Hexile, Hanguish, and Hanxiety,  
Nay, charged without one just pretence  
With Harrogance and Humpudence,  
I here demand full restitution,

And beg you'll mend your Hellocution.

The story is told of a little maid-of-all-work, that when asked by her mistress whether her name was Anna or Hannah, she replied, "Anna ma'am. Haitch, Ha, Hen, Hen, Ha, Haitch, 'Anna."

It is often asked why the letters M and N are used in the English Prayer-book in answer to the question "What is your name?" and in the marriage formula for publishing the banns. Some think the M stands for *Maritus*, the Latin word for husband, and N for *Nupta*, bride, but this cannot be, as in the older Prayer-books N only is used and the M does not appear at all. It is probable that the N was originally adopted as meaning *Nomen*, the Latin word for name.

## 'MIND YOUR P'S AND Q'S'

"Mind your p's and q's" is a very common expression, and has been said to refer to the old habit of chalking up the pints and quarts of refreshment which a man consumed at an inn, and paid for at the end of the week. But it is far more likely to be an expression that originated in printing offices, where, when letters are reversed, as they are in type, the small p's and q's are very liable to be mistaken for one another.

It has often been remarked that acrobats and circus-riders in taking professional names are very fond of adopting names that begin with Z. And yet the letter Z is very rarely found as the initial of a real surname. It is said that never within living memory has a member of the British House of Commons had a name beginning with Z. On the other hand, the Parliament of Victoria, Australia, has never been without such a name, Zincke, Zox, and Zeal being one or two examples.



# SOME LITTLE DOLLS OF OTHER NATIONS



These are some of the interesting little nursery playmates of twelve other lands. The countries that these dolls come from are as follows:

Henriette	Ivan	Kate	Parina	Hungary	Lotus Blossom	Japan
Gretchen	Filomena	Sarah	Ahweah	India	China	Africa
Peter Wilhelmina	Dolores	Chandi				

We learn how to dress these pretty dolls in their own picturesque national costumes in the articles beginning on page 3393 of this book.

## DOLLS OF MANY NATIONS

### PLAYMATES OF OTHER LANDS AND HOW TO DRESS THEM

We all know that our little friends in other lands do not dress as we do and the coloured picture shows us the kind of clothes they wear. We should be able to tell whether a country were warm or cold if we saw the children dressed because those who lived in the cold place would be well wrapped up in thick woollen cloth while the children in the warm climate would wear thin muslin or cotton stuff and very likely have bare feet.

In hot countries the sun is so strong that it scorches the skin so we should find the children had very brown complexions—quite a deep rich colour compared with those who live in colder climates. Generally speaking in a hot country the hair of the people will be dark, while in a cooler atmosphere the people will be fair. For instance in India they have black hair while in Sweden and Norway most of them are fair and have yellow hair.

There are differences in manners and customs as well as in faces and hair. In some countries the people are far more industrious than in others—generally in the colder ones.

Don't you know how you feel more inclined to work hard on a sharp frosty morning than on a hot August day? Well the cold and hot climates have exactly the same effect on the people who live there.

We are going to suppose that we have twelve dolls, and that we want to dress each one to represent one of our little friends in other lands. First, we shall find out exactly how to dress a doll like a little French child.

#### HENRIETTE—THE LITTLE FRENCH DOLL

French women are noted for their good taste in clothes, and the French girl always looks very neat even if she is quite poor.

The rich people like to dress their children elaborately, their little frocks are most beautifully made and often cost a very great deal of money. So we must dress the French doll very daintily, using fine blue glass beads for the dress with plenty of lace on the underthings—very full petticoats with frills and frills of lace and lots of tucks and everything to make it look dainty and very full all round the skirt. Once the long bodice and very short skirt is shown in the picture also the wash of pink skin with fringed ends.

French children are very often dressed entirely in pink, and always show their knees until they are quite tall.

Observe the white socks, patent and kid boots (either black or pink), the hat being up nearly to the top of the head and the smart little parasol. The hat is very full and made of lace with a blue bow to trim it.

The doll's name is Henriette, and we would wear a typical French dress and

or perhaps a string of little pale pink corals. She would have a gold bangle, or perhaps two on her arms and a bow on her hair of either black or pale blue silk ribbon.

We must choose a wax doll with a pale complexion and dark hair. In France it is the custom to allow the children to stay up late at night often till the parents go to bed so that we shall hardly ever find a child who has pretty rosy cheeks.

#### GRETCHEN—THE LITTLE GERMAN DOLL

Now we will take a peep into Germany to try to find out what the little peasant children who live there are wearing. We shall have to go right out into the country to find a costume that differs from our own for if we



sought out the little girls and boys of Berlin and the other big German towns we should find them dressed very much like London children. Nevertheless the peasant class differs from ours because it has a definite costume which it wears both on work and for play.

The most striking feature is the Crannie bonnet with its straight front quite stiff and plain, and well pouched back. Look at Gretchen's picture and you will see it. It would all be made of cotton stuff but of two colours, the back part is white, and the stiff part which goes round the head pale blue edged with a tiny frill of white.

When we dress our doll we must part her hair and part it into two pig-tails, fastened at the ends with small bows of red ribbon. Therefore in choosing our doll we must see that she has long, fair hair almost yellow in colour. She should have a plump, healthy figure and a good, healthy colour.

The sort white lawn blouse is cut rather low in the neck. It is full and puffed just a little over the top of the corset belt which Gretchen wears. This is made of black velvet, and is a straight band in shape supported by two bands going right over the shoulders. It is faced with red.

The skirt is of cloth of cotton, and if the blue is a favourite colour. Make it full and gather it into a plain band. It is put on over the blouse, and the corset which is a sort of waistband is ready over the full skirt.

The apron has no laces but quite a make-up of frills by having two pockets—one on each side. It is made of white muslin or cotton with a frill at the bottom. Make that it full gives a blue any way very up the sides of the apron.

The stockings are white and the shoes either brown or black with a new lace and of a nice comfortable shape. The shoes are made of white leather with a small band which comes just below the heel.

The doll's name is Gretchen, and we would wear a typical German dress and

# GRETA—THE LITTLE SWEDISH DOLL

This time we are going to see how a little Swedish doll should be dressed. First of all, we must know that the climate of Sweden



is much colder than ours though they do have warm weather in the summer-time, just as we do, it is generally much more snowy and icy in the winter. So that explains why they wear such thick stuffs and warm clothes. The girls and women are very industrious,

and fond of fine needlework. They make most delightful embroideries for their houses, and decorate their own and their children's clothes with charming needlework in wools and silks. They make delicate little patterns on the children's caps and bonnets, and think nothing of embroidering a small coat all or sleeves and back and front as well. Their table-linen and household things are always beautifully worked. When they go out to tea it is quite the custom to take some stitching with them. Some of us would be put to shame if we saw the large amount of manual work the Swedish children do.

When a girl is going to be married, sometimes her friends will arrange together to work a quilt for her. They collect small squares of plush or other rich material, each one takes a piece home, on which she embroidered very beautifully her own Christian name. Afterwards all the squares are sewn together, and the bride has a loving souvenir from all her girl friends.

Of course, there are different variations of the costume, peculiar to different parts of the country of Sweden. This has been chosen as being one of the prettiest.

This doll's name is Greta—pronounced just as it is spelled.

As the picture will show, she wears a white shirt made of fine muslin gathered into a straight neckband, a velvet vest, buttoned together in front with gold buttons, made of red and blue striped silk. A piece of red velvet or broad would give the right color. If we are unable to get the right kind of it, The kind known as English silk can be bought striped alternately red and blue, and it is quite cheap.



The jacket is made of dark plush green cloth, and here we have the velvet vest, which goes all over it, is a pattern of red and blue stripes and has a small collar. It is made of a dark velvet or broad. The pockets are of the same material. The doll's hair is made of black wool, and the face is of a light brown color. The doll's hands are made of a light brown color, and the feet are made of a light brown color.

The doll's hair is made of black wool, and the face is of a light brown color. The doll's hands are made of a light brown color, and the feet are made of a light brown color.

white lines, which may be suggested by cotton threads run evenly through the surface of the cloth.

The pocket is the most fascinating detail. It is dark blue or red at the back, with a white front forming the pouch part, ornamented with pieces of the red cloth cut out in shapes sewn on with white thread; the stitches show and form white spots or crosses round the edge of the red shapes.

The cap is red satin, with yellow and blue flowers and leaves embroidered on it. It is in shape rather like our Puritan bonnets, but more open at the back, showing the hair well, and pointed in front.

The Swedish people are very fond of embroidery. Just notice how much there is on this one costume.

The shoes are black, with tongues and buckles, and the socks are white.

## FILOMENA—THE LITTLE ITALIAN DOLL

In beautiful Italy there are, of course, many classes of people, just as there are in our country, but it is only among the peasant class that we shall be able to find a typical or distinctive costume. The town folk dress much as we do. The dress we can see in the picture is one that would be worn by a little fisher girl. Her name is Filomena. We must try to buy a doll with dark hair and



eyes and an olive-tinted complexion, because we have to represent a little girl who spends many hours of her time in the open air and bright sunshine. So she must have a brown skin, and a pretty pink colour in her cheeks.

To describe the frock, we will start at the top with the head-dress, which is made of a square scarf, either white or any gay, light colour. We will choose red with an orange and blue border. It should be folded cornerwise, and placed on the head with the two corners which come together hanging down at the back, and the other two—which are folded in half—hanging at the sides. The side pieces are then raised to the top and pinned there.

Next comes a pair of red coral ear rings, and a coral necklace to match.

Filomena's blouse should be made of fine white lawn, made very simply, and gathered at the neck into a narrow band. The sleeves are long and full, and are finished with a narrow cuff. The skirt is made of the same material, trimmed at the hem with a couple of rows of bright scarlet braid. The outfit should be made full and loose.

The little coral belt which are quite a feature of all Italian peasant costumes, are made of black velvet, and drawn together with red laces. We shall not find these difficult to make. We shall find them to our advantage, since a little more than the ordinary of these are worn with pieces of material drawn up, so that they will keep up to the waist. The red laces to thread the holes through, are made of a light brown color, and are drawn up to the waist.



## DOLORES—THE LITTLE SPANISH DOLL

SPAIN is very often called Sunny Spain, because the climate is warm bright, and full of sunshine. People who live in hot



countries always love bright colours about them in their houses and streets and on their dresses, while people in colder places generally wear greys, black, and dark colours so that we must find for our Spanish doll some very bright pieces of material. She will represent a dark girl upright and of graceful carriage. The women of Spain are noted for their beauty and have dark flashing eyes so we must try to find a doll to fit these requirements. She must have plenty of dark hair as it has to be done up.

This costume is one which would be worn on fête days and holidays by a girl from thirteen to fifteen years old. At other times the girls dress very much as we do. The most noticeable feature is the shawl which is always brightly coloured and has all round it a deep fringe knotted at the edge and made of fine black silk.

We must get a square piece of soft silk, brightly coloured and patterned. For instance an orange ground with red and green flowers on it or a pink ground with a small pattern in purple, deep red, and blue would do. Sew the fine black silk fringe all round the edge and the shawl is made. We must fold our shawl from corner to corner and put it round the doll's shoulders, as shown in the picture crossed in front with the end loosely tied behind. Notice at the same time that the fringe is a deep one in proportion to the size of the shawl, so that it is knotted at the edge joining the shawl.

The bare throat should be decorated with one or two rows of coloured beads.

The kirt is a shape such as we wear made with a full at the hem and short enough to show the ankles. The full should be put on in little box pleats, as shown in the picture.

The stockings are white, the shoes black, held on by the pretty little cross gartering which can be made of narrow black silk or velvet ribbon. Fix an end of the ribbon to each side of a shoe, bring the ribbon round cross it in front, and tie as shown in the picture.

The cotton apron is striped in several colours—it might be blue, green and red, or perhaps a pink one with mauve stripes. Certainly it would be very bright.

The hair is a very important item; must be dressed high up on top, and should have a very tall comb stuck in behind, which shows from the front. A row of deep red or bright pink will be stuck in on the left side.

It will perhaps be impossible for us to get a back-comb or a wire to fit the doll. As it is a very necessary feature of the costume here is a suggestion. Get an ordinary back-comb which will just fit the top and fine it down by using wire which has been used because it will have been cut with a sharp pin. And

the edge smoothed with sand paper or a nail file. So we shall not find it a hard task to make a back-comb to fit our doll.

Sometimes the Spanish girls wear a lace scarf to drape the hair; this is called a mantilla. It looks very charming in lace but it is not usually worn with a fringed shawl; it accompanies a costume more like our own—that is a dress with a bodice and skirt as we wear them. It takes the place of a hat and is always worn at a bull fight, the most popular entertainment in Spain.

## PANNA—THE LITTLE HUNGARIAN DOLL

As in most other European countries so in Austria and Hungary—it is only the peasants who still keep to their national dress.



In Hungary they wear a costume like that of the little girl in the picture. It is very charming indeed and belongs to the part of Hungary called Croatia. We will call our doll Panna. She will have a happy little round face with a healthy colour, brown hair and laughing eyes.

Her cap or bonnet which we will describe first, is one of the prettiest head-dresses imaginable. It is made of hand-woven cotton or linen, white or cream and embroidered very beautifully in the brightest red, green and violet silk. It is possible to buy. The shape of the cap is very simple for it is only two straight pieces of material.

The embroidery on the front and bonnet, of which we give a design on this page, must be copied as accurately as possible because it is a very important feature of the costume.

The bonnet is worked in two shades of geranium-coloured red—a deep bright scarlet and a very pinkish red. These are not colours which we should put together but they are extremely becoming to the wearer. The dark parts in the design given are filled in with violet and a soft greyish green. The silk used is thick and bright. The back ground is filled in with red so that no material shows between the pattern.

We must use the design once for the back piece and repeat it twice for the front of the cap, joining the pieces which we see on



The pattern for the embroidery

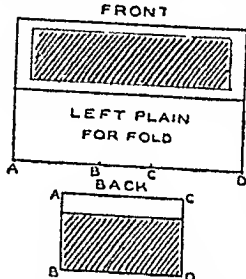
page 33A where the letters correspond to the back piece on the front, and a piece of back to go on the front. The bonnet which is set in with lace stitches, the effect being very like drawn thread work.

The most curious part of the cap is the "fold." The part from x to D is doubled back, bringing the embroidered half of the front to meet the back of the bonnet, and hiding the plain half of the front altogether.

The lace at the edge is of woven brown thread, of a more or less unbleached colour, and it is put on just slightly full.

For the skirt and blouse white cotton is used, embroidered all over in a spot pattern. Cross-stitch is used, and the colours are black and red. Note well how the pattern is arranged in the picture, and also observe the shape of the skirt and blouse. The sleeve is finished with a frill at the wrist, and the skirt is just gathered into the waist.

The coat, which is quite plain in shape and without sleeves, is made of dark blue cloth lined with red silk.



The bonnet pattern

The edging is a strip of white cloth "pinked" out to form a border, and put on in between the lining and stuff, so that it stands out all round the edge of the coat. It only differs from the ordinary pinking which we have on our lamp-shades in the little hole in

each point. The two rows of very tiny buttons are silver in colour, and very bright. The little apron matches the dress in colour and material, except the border which edges it, and appears again a few inches inside.

The sash is a woven wool, or cotton braid, in bright colours—we call it "galon."

Panna wears a necklace of big red and black beads, threaded alternately—first a red and then a black, and so on.

### SARAH—THE LITTLE ARMENIAN DOLL

THE complexion of the Armenian people are olive, the hair black, the eyes dark, and the women are noted for their long lashes. Altogether they are considered a handsome race, though their features are large. Our picture shows a little Armenian girl whose duty it is to fetch water in the beautiful earthen pot which she slings over her shoulder by a cord—for there are no water-pipes in Armenia.

Her costume is of cotton stuff—it is hot in the country where she lives, so she will not dress in thick material, the skirt is full, and hangs in flutes all round. It is cut several inches off the ground in length, and shows her bare feet and ankles.

The stuff is beautifully patterned in rich colours in what we usually call the "pine pattern." The little bodice which joins the skirt (they are sewn together at the waist) is a plain, tight-fitting affair, with long sleeves coming to the wrist, where they fasten with a small, plain cuff. It has no collar, and it is fastened in front with a few buttons.



Over this she wears a coat made on the same principle as the costume. It has a full skirt joined to a plain top. The coat-skirt is shorter than the dress-skirt, and the coat-sleeves are short, coming to the elbow, and finish with a narrow frill of the material, which, by the way, is a dark blue or dark purple cotton.

Over the coat she wears an apron. There is plenty of stuff in the apron, but it is all gathered in so closely that it does not cover up much of the front of her dress. It is made of white cotton with a wide border of blue or patterned material.

The head-dress is very simple—just a brightly coloured handkerchief or square of cotton folded round the head.

### AHWEAH—THE LITTLE ESKIMO DOLL

WE all know where the Eskimo people live—right up near the North Pole, where it is always cold, and the winters are long and dark. It will not take us long to guess, when we think of this, how these people are dressed. Of course they are wrapped up in fur, because there is nothing else in the world which keeps one so warm and cosy as fur does.



The people are very strong and rather plump. They are decidedly small in stature, and have small hands and feet. Their complexions are swarthy—by that we mean, of course, that the skin is a pale yellowish brown—and they have broad, flat faces, with eyes that slant in a way that reminds one of the Japanese.

The most strange part about the Eskimo costume is that the men and women are dressed alike, both wearing trousers, boots, and gaiters. The only difference is that sometimes the lady wears a few beads.

The garments themselves are quite plain in shape, and the only ornamentation is a white skin sewn into the middle of the front. A pointed piece of fur, either cut from the tail or head of the animal, makes a sort of little tab or finish at the bottom of the front of the coat. The cuffs are, white, too, to match the front piece.

The hood is a warm, tight-fitting one, coming closely round the face, and it has a little point sticking up behind.

The little girl shown in the picture, whose name is Ahweah, wears, of course, trousers to keep the cold from her legs. They are stuffed inside the top-boots, which are made of leather, with good stout soles to keep the wet out. The gloves are of leather, too, and have a thumb-piece only, like a baby's gloves.

Her hair, which is jet black and very straight, is plaited into two tails as soon as it is long enough. In the front it just hangs in little straight pieces over the forehead, and is decidedly irregular in length. The Eskimo boy has his hair cut off in a straight line across his forehead, a short distance above his eyebrows, but the back grows long just as his sister's does.

## LITTLE DUTCH DOLLS—PIETER AND WILHELMINA

BEFORE we begin to dress these dolls we must look at the picture very closely. We will begin with the boy doll. This costume is very easy to make because it is a very simple one both loose and comfortable as well as warm. We shall see that he has extremely baggy trousers reaching to the ankles. These should be made of dark blue cloth and cut very full indeed.



His coat is of dark grey cloth buttoned up to the neck. Underneath is a red striped waistcoat the collar of which can be seen just peeping above the coat. At the waist are worn two silver buttons always as big as can possibly be afforded. Sometimes they are like small saucers and stretch right across the body but most little boys can only get them the size of a half crown.

At the throat the red waistcoat is fastened with two gold-coloured buttons, and the buttons which fasten the coat are of silver. The buttons of a Dutch boy are his jewellery and a very important thing with him.

Pieter's hat is a felt or cloth one, round in shape and fairly tall but with no brim. This must be made to fit his head. Cut a small circle of cloth for the crown and to this join a straight piece—that is a strip as long as the circle is round. Then make the join as invisible as possible and the cap is complete. These hats are like a tumbler in shape tapering a little towards the top.

The wooden shoes—sabots they call them—can be made out of thin cardboard or canvas glued together if we cannot find a pair of real wooden doll's sabots. They are often to be found for sale in toy-shops however and are quite cheap.

Pieter must of course, be a boy doll with short straight hair. He is fair and has a healthy fresh air complexion.

The little Dutch girl's cap is made of white lace or embroidered muslin. It fits tightly to the head and has wide side-pieces, which turn back from the face and form flaps or wings. These caps are stuffily starched to make the wings stand out so that it makes ours of stiff muslin. If we use lace we shall have to insert a fine wire at the edge.

The bodice is tight fitting, with elbow sleeves. The square neck in front has an inner chemise of white and is bordered with a band of plain or differently coloured silk. From that of the bodice the skirt which is a full mild cotton, round her thus the Dutch girl wears a lacy some neckare of corals several rows held together in front by a large gold clasp.

While in England the women try to look slim the Dutch lady to be really well served must look as big as possible. We must try to appear wide & fat, and the more woman petticoats she wears the better. It is the Dutch girl's pride to have a lot of petticoats. The skirts only come to the knee and the petticoats are cut the same length so that

when she walks the Dutch girl swings her skirts to and fro and the petticoats can be seen. The richer the lady the more petticoats she wears. Therefore we must make our doll plenty of thick petticoats and a dark cloth skirt. Make them all very full gathered in all round the waist.

The apron which should be white or blue has a piece of check material at the top. We can see how this is done in the picture. Notice that there is no bib as we have and that the fastening is a plain band, very narrow buttoning at the back. The sabots are the same as the boy's and an English doll, either dark or fair will do to represent Wilhelmina.

We should remember that there are very many different kinds and colours of costumes in Holland some of course much more elaborate than these, but they all bear a family likeness to the Dutch costumes described here.

The Dutch people wear perhaps the quaintest and prettiest costumes of any

## IVAN—THE LITTLE RUSSIAN DOLL

Russia is such a large country that in different parts of it the climate varies from quite hot to quite cold. On the whole however it is considered

a cold country and in St. Petersburg the capital they have very severe winters, they are so cold that the river freezes over until the ice is strong enough to bear the weight of horses and carts. The people bring out their sleighs and carts specially fitted with flat pieces of steel like huge skates instead of wheels. These glide along the ice road made by the frozen river going along at a tremendous speed.

It is easy to understand that people need very warm clothes for these journeys in fact everyone who can possibly afford it wears furs.

Not only is the hair of the fur warm but the leather from which it grows also keeps out the cold. And so we are going to dress little Ivan in fur.

We must get a little boy doll with short hair in fact just like a little English boy in hair and complexion. First of all he will wear a navy blue sailor suit, like what our boys have but he will wear top-boots with it.

We should be able to make him out of a piece of set lid or leather, none the shape of them.

Next we come to the overcoat which is like ours in shape but lined and trimmed with fur. The fastenings are big buttons of black woollen braid and arranged as shown in the picture. Any dark thick cloth will be suitable for the coat. The collar and cuffs are made of blue silk and the lining of a shorter kind.

The little cap must be of the same fur to the neck and is made of felt to match the coat's collar and cuffs.

It is a very warm coat and because we have made it in such a cold climate we think it will always be carrying protection



## LOTUS BLOSSOM—THE LITTLE JAPANESE DOLL

THE costume worn by the little Japanese girl is one of the most beautiful in the world. The Japanese are great artists, they are wonderful at making exquisite objects out of simple, cheap material. They excel in this point, and we find the idea carried out in their garments. They have, too, a great love of colour, and, by some instinct, they seem to know how to blend colours in a most wonderful way. So that we shall find their clothes simple in shape, made from almost straight pieces of material—and not much of it. We shall also find the colours very beautiful and well arranged.



Now we will find out how to make a costume for Lotus Blossom, which is the English translation of a real Japanese girl's name.

The Japs are passionately fond of flowers, they give the children flower names, and also dress them in material with flowers upon it.

It is quite easy to buy Japanese printed cotton at any large drapery warehouse. We must be sure that it is real, and not an English imitation, for there is a great deal of difference. The price will be less than a shilling a yard.

Perhaps at the same shop we shall be able to buy a Japanese doll, with almond eyes and black hair.

The shape of the dress is very simple—very much like our dressing-gowns, though the sleeves are different. They are long and straight in shape, and have deep pockets in the end which hangs down. The little owner keeps all sorts of things in here beside her handkerchief.

Let us suppose that we have bought a pale green material with branches of flowers, pink, purple, and grey, trailing across it, and here and there lines of black and gold.

A little fold of purple silk—a slightly deeper shade than the flowers—will just show where the gown crosses at the neck. For the sash we must get a piece of stiffer material—Japanese brocade or gold tissue.

The Japanese girl thinks a great deal of her sash, and is very particular about the way it is tied behind. It should be very wide in front, folded at the back with one loop going up and another going down, threaded through a crossway piece.

Lotus Blossom wears wooden shoes with short stilt that fit into holes in the bottom. She lives in these stilts during rainy weather to keep her feet off the wet ground.

To dress the hair of a fashionable girl generally takes about two hours—never less, and often longer, it is not surprising, therefore, that the hair-dressing is expected to last for two or three days.

A great variety of combs is used, and plenty of pomade to form the hair into shape before it is finally fixed. A Japanese girl does not wear a hat in the street—she carries a paper sunshade. We can buy one (doll's size) for a penny at a toy-shop.

## CHANDI—THE LITTLE INDIAN DOLL

IN our collection of dolls we must certainly have one to represent India. Among the natives of that country we should find a great many different kinds of costume. The class distinctions are very great, and the costumes of each class vary more or less. In our picture we see a nurse-girl, or ayah, as she is called. Her name is Chandi. We see that she has bare feet. She



would not wear shoes in the house—that would be considered very rude to her mistress. Just in the same way that an Englishman lifts his hat here, an Indian removes his shoes before entering a house. When in the street Chandi would wear a pair of loose, heelless slippers, made of goat-hide, with turn-up toes and no fastening.

The dress is made of woven cotton material, yellowish in tint and soft in texture. The bodice is like a tunic in shape; it hangs outside the skirt, and comes three or four inches below the waist-line.

It is plain in shape, buttoning up in front with three sets of small buttons, each set containing two buttons.

On the hips at each side the bodice is cut up a little way, and a small piece of the material is inserted to make the garment fuller. The sleeves are plain and fit tightly to the arm, coming only to the elbow. A piping of scarlet cotton edges the neck, the sleeve, and the bottom of the bodice. The Indian woman is exceedingly fond of decorating her costume with a piping of bright colour.

The skirt is made of the same material. It is cut very full and pleated into the waist with a great many pleats, it is cut short enough to show the ankles.

The rest of the costume is composed of a strip of material bordered with a band of scarlet. This piece is draped round the figure and over the head, taking the place of a cloak and hat. To arrange the drapery we must start by tucking one end in at the waist in front; then we must twist it round over the back of the head, and bring the other end over the left shoulder. The ayah holds this in position with her hand as she walks.

She wears many metal bracelets, and on each foot is a metal anklet, one inch wide; they clank together as she walks. A similar piece of jewellery clasps her neck—fastened as old-fashioned bracelets were, with a hinge and a snap at opposite sides of the circle. Her next piece of jewellery is quite easy to make. It consists of very large ear-rings, made of clay or mud, which, while soft, has had stuck into it a number of brightly coloured beads, laid in a pattern composed of either circles or diamond shapes. These ear-rings are so heavy that they are supported by a chain which goes right round the ear.

Chandi's hair is black and very shiny, and is quite straight. It is parted in front and brushed down behind the ears, to be fastened, without hairpins, in a tight knob at the nape of the neck. Her complexion is deep brown all over and her eyes are dark.

# WHAT TO DO IN TROUBLE

## DUST OR GRIT IN THE EYE

When a little speck of grit or dust gets into the eye and no one is at hand to take it out for us there are several things we can do. If we feel that the speck is moving about we can first try shutting the eye a minute. Violent blowing of the nose will sometimes bring the speck out so will tears. We might take hold of the upper lid with the thumb and forefinger and work it gently over the eye towards the nose. If the speck gets fixed on the surface of the eyeball we can dislodge it in this way or by passing a moistened fine camel hair brush or the corner of a handkerchief over the surface of the eye, using a looking glass of course. Bathing the eye with cold water and opening it in cold water will take down the inflammation so will a cold water compress. If a spark from a cigar or a piece of hot ash enters the eye, a drop of olive or castor oil will ease the pain. It is bad to rub the eye.

## SOMETHING IN THE EAR

When by accident an insect flies into our ear we should try to coax it out by turning the ear towards a bright light. So if a bead or hard substance gets in we risk destroying the drum by poking the bead against it. If we pour water in to try to wash a pea or other seed out we might simply make it swell in the ear. The proper thing to do is to hold the ear downwards and gently pull at the lobe. If that fails we must get someone to syringe the ear or go to a doctor.

## TO STOP THE NOSE BLEEDING

If the bleeding is only slight, we can stuff cold water up the nose, apply a handkerchief dipped in cold water to the root of the nose, sit in a chair with the head back, and place a key or a piece of steel at the back of the neck. We should not bend down over a basin. If the bleeding is in a constant stream we should send for ice, lie flat, and plug the nostril with a screw of wet rag until a doctor comes. The collar should be loosened, the hands held above the head, fresh air breathed and a hot-water bottle applied to the feet.

## HOW TO TREAT BRUISES

A blow or a tumble may cause a painful and unsightly bruise which lasts much at the time and turns purple, black, greenish, and yellow due to bleeding underneath the skin. One remedy is to apply something cold, whether it be ice, the blade of a table knife or a cold water bandage. A bruised limb should be rested. Arnica and water—one teaspoonful of arnica to a teacupful of water—are soothing when the skin is unbroken, when it is broken, calendula is applied, but the surface must first be washed free from dust or gravel. It would be as much ground, it must be bound with a clean lanthanum to exclude the air. Sometimes to burn with very hot water gives quickest relief.

## STRAINS AND SPRAINS

We strain the muscles when we overstretch the tendons or muscles. We sprain the ligaments when we go over it when we stretch or

tear the ligaments of the joints in that part of the foot. A sprained ankle may disable us for months and it is unwise to try to walk with it before it is completely cured.

Hot fomentations should be applied to cure a strain or sprain—that is we lay on the part a cloth dipped in water as hot as we can stand then we apply a cold water compress covered with oil-silk and bandaged with gauze in the proper way and rest it.

## WHEN A BONE IS BROKEN

If the bone of a limb be broken the limb is powerless. Should this happen to the leg we must not try to move it but wait till some one comes to lift us on to a stretcher or litter or door. In doing this a rug or sheet should be carefully passed under the legs and these raised and lowered on to it. The injured limb can be lightly tied to a stick or umbrella which may be at hand to give it support and prevent the broken bone piercing the skin. When the arm is broken a sling should be made for it out of a large pocket handkerchief. We can feel along the broken bone and keep the two edges as near as possible together.

## BITES AND STINGS

If an unhealthy cat dog, or any other animal bites us its saliva may poison our blood especially if the bite is taken on a part unprotected by clothing. If the finger is bitten we must at once bind it tightly higher up towards the hand then suck the bite and put out the saliva. As soon as we can get warm water we wash the wound if it bleeds, all the better. Then we get it cauterised—a burning fustic has done duty when proper cauterising was impossible. The bites of insects are relieved by applying liquid ammonia or rubbing with a lump of moistened washing soda.

The sting of the bee can be removed by squeezing the part, or pressing a ring on to the surface to force the sting out.

## THORNS IN THE FINGERS

If we cannot seize the spinter or thorn with the thumb and finger of the other hand or with a pair of tweezers we must get a fine needle—a needle not a pin—and tear open the skin in the direction the thorn entered. Then we stroke it all the way with the needle towards the opening, squeezing the finger to seal the same point now and then, and also sucking it to draw out the thorn.

## FALLING INTO WATER

If we tumble in on a river lake or sea the worst thing we can do is to sit up on our arms try to breathe under water and struggle and scream away. Our first duty, if we can not swim we can at least keep our presence of mind and remember that water will float us if we be quick on our backs. So we are not with the hands open and call for help. If we are in the water we must take care to get out to grip that person round the neck who is of use, and drag him down with us if

## A LITTLE VEGETABLE GARDEN WHAT TO DO AT THE END OF MAY

It may be that tomatoes are among the things that we have set our hearts on growing. For inexperienced young gardeners the best way to proceed is not to attempt to rear the plants from seed, but to buy a few young plants—a shilling will probably buy more than we need—and they should be ready to plant in the open after a few days' hardening off. This process is very necessary, as they will have been grown under glass. We will stand the pots a few days in the open, and protect them at night if the weather be unfavourable. After that we must choose a warm, sunny position, and there is nothing better than the foot of a wall looking south. The soil should have been well dug and a little stable manure put at the bottom of each hole, then a layer of soil above it. The hole should be large enough to take the roots quite comfortably.

The usual plan nowadays is to grow only one stem, and even from this the side shoots must be pinched out. The young plants for a time should be watered in the morning rather than the evening, but too much water should not be given, or it may happen that we get luxuriant foliage and not so much blossom as we desire. All the same, the plants must never suffer for lack of water. If the little gardens are full already, or there is no favourable position for the plants, good specimens may be grown in large pots, in boxes, or in lard-tubs.

Soot-water is excellent to use sometimes in turn with clear water and manure-water for our plants. It may be helpful to know how to prepare it. We want some large tub or other vessel, and we tie up our soot in a bag of some coarse material. Lay a thick stick across the top of the vessel, and with a bit of strong string suspend the bag so that it is below the surface of the water. If the water is very deeply coloured we can add some clear water before using, for it must not be used too strong.

It is difficult to give the exact date when to transplant young greens from the seed-bed, so we will say when they are about three

inches high. Perhaps we are hoping to grow them on the ground now occupied by the early potatoes. In that case there is some time to wait, for the potatoes are not yet ready to be lifted, but, rather than let the little broccoli and other greens be closely crowded together, we may prick them out a few inches apart on some small bit of spare space, and plant them again to the proper distance apart as the ground becomes vacant.

Do not let us forget what has already been said as to growing lettuces successfully—they must never lack moisture.

The summer is the time for shows and exhibitions, and if we want to exhibit we must prepare for it a long while beforehand by seeing that our vegetables have especial attention. In arranging a dish, let us say, of potatoes it will not answer to pick one, two, or three very large specimens, and the rest very much smaller. We ought to aim at a uniform size, as far as possible—a good even lot—and this applies, of course, to most of the subjects. Suppose we are arranging a basket of vegetables, then let us use plenty of parsley as a background, it helps to make the vegetables look inviting and tasteful.

We may plant out the half-hardy annuals that we have been rearing in boxes, or may choose to buy at this season. In fact, the last week in May is the time when we should fill all vacant places in the flower-beds with plants to make our garden bright and beautiful during summer. In some cold districts cannas, begonias, and dahlias that have been started under glass are generally not trusted to the open until the first week in June.

After everything is in place for the summer it is rather a good plan, if needed, to put a little clean, fresh gravel along our garden path, and to see that the edging, whatever it be—box, or stones, or tiles—is quite trim.

Now that the spring flowers are over it is a good thing to remember that plants are weakened if we let them ripen their seeds, so these should be cut off at an early stage. We may sow the seeds of wallflower for next year at any time from now onwards.

## ANSWERS TO THE PICTURE PUZZLES ON PAGE 3282

1 The nut-crackers are on the grapes, and the grape scissors are among the nuts.

2 The handle of the pump is on the left instead of on the right of the spout.

3 The positions of the knife and fork, in relation to the plate on the table, are reversed.

4 These scissors have no centre screw to join the two parts together, and act as a pivot.

5 The handle of this railway-carriage door is on the side next to the hinges.

6 The flag is waving against the wind, the direction of which is shown by the driving clouds and the bending trees in the distance.

7 The trigger of the revolver is the wrong way round.

8 The rose is growing on a vine tendril, as is shown by the shape of the leaves.

9 The football-player is playing the Rugby game with a round Association ball. In Association, the players are not allowed to handle the ball, the Rugby ball is of an oval shape.

10 The sword which the warrior wears is buckled on to his right side, whence it would be difficult to draw it with his right hand.

11 The tram is running past its signal, which is set at danger.

12 The horn of this motor-car is out of easy reach of the driver.

13 The hour of four on most watches is indicated by the old sign IIIF, instead of IV.

14 This motor-van has no number at the rear, as required by the law of the land.

15 These two trains are running side by side, though there is only a double set of rails.

THE NEXT THINGS TO MAKE AND THE THINGS TO DO ARE ON PAGE 3511

# The Child's Book of SCHOOL LESSONS



READING

## HOW PLACES GET THEIR NAMES

A GREAT deal that is very interesting is to be learnt from the names of places but as it would take far too much space to give all the interesting place names even in Europe alone we shall consider only the names of places within the British Isles.

ANGLESEY comes from two old words *angul* *ey* meaning the island of the strait. The word *ey* means island and is found in many of our place names as Chichea Putney Orkney. So Anglesey has nothing to do with Angles, nor should it be spelt Anglesa.

BERKELEY where Edward II was murdered is called after the birch tree *BERA* meaning birch.

BERKSHIRE called *Beroc-scire* in Alfred's time means forest shire.

BEVERLEY in Yorkshire is really *Beverlac* the lake of beavers.

BIRMINGHAM or more correctly Beorning ham appears in Domesday Book as *Bernungeham*. It was afterwards called *Bromwych* ham which still survives in West Bromwich and Brummagent.

BUCKINGHAM comes from the Anglo-Saxon *loc*, a beech tree, because there used to be fine beech forests in the county.

CAMBRIDGE was originally called *Cam boru* by the Romans later on the Saxons called it *Granta bridge* or bridge over the Granta which was another name for the river Cam. Its modern name *Cambridge* means of course, the bridge over the Cam.

CARDIFF is *Caer Taff* the fort on the river Taff the same word

Taff is seen in the name Llandaff.

CHESTER is for *Cerpstow* a place of sale from the Anglo-Saxon *ceap* meaning cattle business or market. It is also found in *Chaprade* *Chipstead* *Clipping* *Norton* *Cluppenham* and many other names.

CHESHIRE means the Chester shire and Chester is the Anglo-Saxon *ceaster* a camp from the Roman *castra* a camp. The full name of Chester in Roman days was *Devana Castra* the camp on the Dee.

CORR means swamp or marsh and is really the Irish word *Corco h* or *Corraig* a swamp. It is so called because it is built on a group of islands that were formerly a swamp.

CORNWALL is derived from the same word as Wales. Cornwall is short for *Cornwalla* land the land of the Corn Welsh. The Anglo-Saxon called the earlier inhabitants of Britain Welsh that is foreigners.

CUMBERLAND is from *Cumbria* the land occupied by the Cymri. These people were of the same race as the Welsh and the original name of Wales was *Cambria* or the land of the Cymri.

DORSET was *Dorsæta* in Anglo-Saxon from the word *der* water probably referring to an early settlement of Britons by the sea or *der*.

DORCHES used to be called *Salmar* or salt springs. Its present name comes from *try h* or salt house and *der* meaning the salt probably meaning

the house where the droits, or dues on the salt, were paid. The same word *wych* comes in Nantwich, the town in the Cheshire salt district.

DUBLIN is the Irish *Dubb-linn*, meaning black pool.

DURHAM is short for *Dun-holme*, hill-island, which was softened by the Normans to *Duresme*, pronounced *Doo-rame*, and so became Durham.

EDINBURGH was originally *Edwinesburg*, the town or borough of Edwin King of Northumbria, who captured the place about A.D. 617. The Gaelic word for this is *Dunedin*, *Dun* meaning town, and *Edin* meaning Edwin's. So the New Zealand town, *Dunedin*, is really *Edinburgh*.

GLAMORGAN stands for *Gwlad Morgan*, the territory of Moigan, a Welsh chief who lived about a thousand years ago.

GLASGOW most probably comes from *Cleschu*, or *Glaschu*. In Celtic, *glas* means green, and *cu* or *ghu* means dear; so Glasgow may mean "the dear green spot." Others say it comes from two words meaning a dark glen.

GLOUCESTER gets its name from the British *Caer-Glou*, or camp of *Gloui*, who was a son of the Roman Emperor Claudius. The Romans called it *Glevum*, and, later on, the Saxons called it *Gleauan-caestre*. The *caestre*, or *cester*, is the Roman *castra*, camp.

HEREFORD means "army ford."

HERTFORD is most likely a corruption of Hereford, although some say it is Herudford, that is, red ford, and others say it is "hart ford," because harts used to cross there.

ILFRACOMBE was *Alfredscombe*, the combe, or valley, belonging to some Alfred.

IPSWICH was *Gippes-wic*, the *wic*, or village, on the river Gipping.

LANCASTER means the *caster*, or camp, on the river Lune.

LEICESTER means the *caster*, or camp, on the river Leire, as the river Soar used to be called.

LINCOLN was called by the Romans *Lindum-colonia*. *Lindum* is a Celtic word meaning "the hill-fort by the pool." *Colonia* is a Latin word meaning colony, and is found in Cologne.

LIVERPOOL is probably *Llyorpwll*, meaning "the expanse at the pool," though some people think it is from *Litherpul*—"the stagnant pool."

LONDON is, in all probability, a corruption of *Llyn-dun*, the name given by the Britons to their settlement on the banks of the Thames. The name means a fort by a pool or lake, and is the same as the *Lindum* in Lincoln.

MANCHESTER is the Saxon *Mancestre*, or *Manigceaster*; the Romans called it *Mancunium*.

MERTHYR-TYDFIL, in South Wales, is interesting as meaning "the martyr Tydfil." Tydfil was the daughter of a Welsh chief, Brychan, who gave his name to the town and county of Brecon, and she is said to have been put to death by pagans on the spot where Merthyr now stands.

NORTHUMBERLAND used to mean just what it says, the land north of the Humber. Now its meaning has been narrowed down to a single county.

NOTTINGHAM has lost its first letter; it used to be *Snottingham*, the place of caves, because the town is undermined with caves cut out of the soft sandstone. The old name still survives in *Sneinton*, a district of Nottingham.

OXFORD used to be *Oxenafor*, and then *Oxenford*. Most likely it means a ford for oxen, though some people think the *ox* is connected with a word meaning water, seen in *Usk*, *Ouse*, *Isis*.

PEMBROKE means practically the same as *Land's End*. *Pen* means hill, or head, and *Broc* a district. *Pembroke* is to Wales what *Land's End*, in Cornwall, is to England.

PENZANCE means holy headland.

RUTLAND means red land.

SHEFFIELD takes its name from its river, the *Sheaf*.

SHREWSBURY is a corruption of *Scrobbesbyrig*, meaning the town in the wood.

SHROPSHIRE means the shire of *Scrobbesbyrig*, or *Shrewsbury*. The Normans changed the name to *Sloppesburie*, and this gives the other name by which it is often called to-day, *Salop*.

SOMERSET is the home of the *Sumer-saetan*, but what that means is not quite certain. Some think it is for *Suthmorset*, meaning the south moor settlement.

STAFFORD is for *Statford*, or *Stadford*, and does not mean, as many people suppose, "the ford crossed by means of a staff, or upon stilts."

SURREY means "south kingdom."



and comes from the Anglo-Saxon *Suthrey*. It was so called because it was south of London and the Thames.

**TAMWORTH** means the estate on the river Tame. Worth, meaning estate comes in several names such as Walworth.

**TEWKESBURY** takes its name from Theoc a hermit, on the site of whose cell the monastery of Tewkesbury was built.

**TIVERTON** is really Twyfordton the town at the two fords. Several places where there were two fords got the name of Twyford.

**WEDNESBURY** is an example of a town named after a heathen god Woden. This town was built on the site of a temple of Woden and was called Wodnesbeorh. The same god's name comes in Wednesday.

**WESTMORLAND** means the land of the people of the Western moors.

**WILTSHIRE** is for Wilton shire. Wilton is a small town in Wiltshire so called because it is on the river Wily. It was the ancient capital of Wessex and so gave its name to the county.

**WOLVERHAMPTON** used to be simply Hamton meaning high hill. Later it was called Wulfrunshampton after Wulfruna the sister of the king who founded St. Peter's Church there.

**WORCESTER** was called by the Saxons Wigornaceaster a name which they took over from the Roman Wigornia. Possibly the name is connected with the Ifwices a tribe who held that district at one time.

**YORK** was called Caer Eborac by the Britons and Eboracum by the Romans and these are really the same names as York though they look very different. Eboracum became Eborwic and that became Eborwic which was pronounced Yoric and so we get the name York.

## ARITHMETIC

### ADDING AND SUBTRACTING FRACTIONS

WE know that a fraction is *part* of a thing also that the number underneath shows the number of parts into which the thing is divided while the number above it shows how many of these parts have been taken to make the fraction. It is clear then that the numerator should be a smaller number than the denominator.

But suppose we divide each of two units into four equal parts. There will be eight parts altogether each of which is a quarter of a unit. Now if we take five of these parts we shall have a quantity which we may represent by  $\frac{5}{4}$ . Such a quantity being more than a whole unit, is not properly speaking a fraction. It is therefore called an *improper fraction*. This particular improper fraction plainly consists of enough quarters to make a whole one and another quarter besides. It is, the 1 one and a quarter which we express by writing the 1 with the  $\frac{1}{4}$  close to it thus  $1\frac{1}{4}$ . A quantity like  $1\frac{1}{4}$  is called a *mixed number* because part of it is a whole number and part of it is a fraction.

First then it is clear that we can convert an improper fraction into a mixed number by dividing the numerator by the denominator. For 5 quarters which make a unit are

contained in five quarters once and there is still a quarter left. That is five quarters make 1 and  $\frac{1}{4}$  or  $1\frac{1}{4}$ .

**EXAMPLE** Convert  $\frac{17}{4}$  into a mixed number.

Dividing 17 into 4 we get a quotient 4 and a remainder 1 which means there are 4 units and 1 quarter. So that  $\frac{17}{4}$  is equal to  $4\frac{1}{4}$ .

Express  $\frac{37}{4}$  as a mixed number.

Here 32 is contained 4 times in 37 and there is a remainder 5. Therefore  $\frac{37}{4}$  is equal to  $9\frac{5}{4}$ . But  $\frac{5}{4}$  can be brought to lower terms by dividing numerator and denominator by 4 which gives  $\frac{1}{4}$ . Thus  $9\frac{5}{4}$  equals  $9\frac{1}{4}$ .

By using this process as it were we can express a mixed number as an improper fraction. We have simply to multiply the number of units by the denominator and add to the numerator.

**EXAMPLE** Express  $2\frac{1}{4}$  as an improper fraction.

Here the number of sevenths in 2 is 7 times 2 or 14 which with the 3 sevenths make 17 sevenths or  $\frac{17}{4}$ .

We are now sufficiently advanced to understand how fractions are added together, or how one fraction is taken from another. A number of any era can make the process quite clear.

**EXAMPLE** Add together  $\frac{1}{4}$  and  $\frac{1}{4}$ .

## THE CHILD'S BOOK OF SCHOOL LESSONS

We can only add quantities together when they are quantities of the same sort. Here we have 4 fractions which all have different names, such as "thirds," "sevenths." Our first step must therefore be to express them all as fractions with the same name, that is, we must make them have a common denominator. We already know how to do this. The L.C.M. of 7, 21, 3, 42 is 42. We arrange the work as shown here, using the sign + to denote addition,

$$\begin{aligned} & \frac{7}{7} + \frac{1}{3} + \frac{2}{7} + \frac{5}{42} \\ = & \frac{18 + 16 + 28 + 5}{42} \\ = & \frac{67}{42} = 1\frac{25}{42} \end{aligned}$$

we say 7 into 42, 6. Then 6 times 3, 18. Write 18 for the first numerator. Proceeding in the same way, we get 16, 28, 5 for the others. We have now to add these together. The total is 67. Thus, the sum of our fractions is  $1\frac{25}{42}$ , or bringing this to a mixed number,  $1\frac{25}{42}$ .

EXAMPLE Find the value of  $1\frac{1}{3} + \frac{1}{4} + 3\frac{7}{8} + 5\frac{1}{2}$ .

$$\begin{aligned} & 1\frac{1}{3} + \frac{1}{4} + 3\frac{7}{8} + 5\frac{1}{2} \\ = & 9 + \frac{27 + 40 + 14 + 18}{72} \\ = & 9 + \frac{99}{72} = 9 + 1\frac{11}{8} \\ = & 10\frac{11}{8} \end{aligned}$$

When we have mixed numbers, we first add the whole numbers, which here total 9, and then proceed with the fractions in exactly the same way as before.

Their total is  $1\frac{25}{42}$ , or  $1\frac{25}{42}$ . Adding the 9 to this, and reducing  $\frac{25}{42}$  to its lowest terms, we obtain the result,  $10\frac{11}{8}$ .

Subtraction is worked in a similar way. EXAMPLE: Take  $\frac{5}{7}$  from  $1\frac{1}{3}$ .

$$\begin{aligned} & 1\frac{1}{3} - \frac{5}{7} \\ = & \frac{33 - 25}{135} \\ = & 1\frac{8}{135} \end{aligned}$$

The common denominator is the L.C.M. of 27 and 45, which is found to be 135. The numerators then become 33 and 25. Subtracting 25 from 33 we get 8. Therefore, our result is  $1\frac{8}{135}$ .

EXAMPLE: Find the value of  $7\frac{2}{3} - 3\frac{1}{3}$ .

As in addition, we deal with the whole numbers first, taking 3 from 7. We are left with the problem of taking  $\frac{1}{3}$  from  $4\frac{2}{3}$ . Arranging the work as shown, and bringing

$$\begin{aligned} & 7\frac{2}{3} - 3\frac{1}{3} \\ = & 4 + \frac{2}{3} - \frac{1}{3} \\ = & 4 + \frac{10 - 3}{45} \\ = & 3 + \frac{55 - 33}{45} \\ = & 3\frac{22}{45} \end{aligned}$$

the fractions to a common denominator, we find that we cannot subtract the numerator, 33, of the second from the numerator, 10, of the first. We therefore call one of our 4 units 45 forty-fifths, and add it on to the 10 forty-fifths. This leaves us with 3 units, and 33 forty-fifths to take from 55 forty-fifths, which gives  $\frac{22}{45}$ . Thus the result of our sum is  $3\frac{22}{45}$ .

Of course, these are simple examples of the addition and subtraction of fractions, but any number of fractions, however large and complicated, are added or subtracted in the same way.

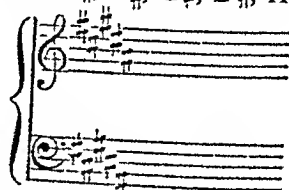
## MUSIC

### THE LAST OF OUR FAIRY LADDERS

THERE are still two more fairy ladders for us to know—B major and its tonic minor. If we use our memories, we shall recall a very important fact—that in all the scales with sharps, the last sharp is the seventh note—that is, the leading note of the scale. So as A $\sharp$  is the seventh note in B major, we know it is the new sharp, and the last one in this particular scale; therefore the sharps forming the signature will be between, and include, F $\sharp$  and A $\sharp$ .

We also remember that the order in which the little sharp goblins proceed is by perfect fifths, so our

signature is F $\sharp$ , C $\sharp$ , G $\sharp$ , D $\sharp$ , A $\sharp$ , thus

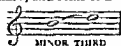


Now, what about the fingering? Well, the right hand has been thinking fondly of the first five major scales, C, G, D, A, E, and their tonic minors, and it has come to the conclusion that just for these two scales the old way

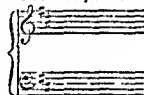
shall again be taken, so the fourth finger of this right hand is to be found on A $\sharp$  the seventh note of both B major and B minor. Here is B major



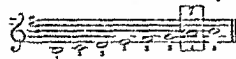
We also want to write B minor but first of all we must find its signature. All we have to do is to find the relative major. We walk up three semitones or a minor third, and come to D



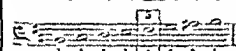
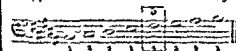
The signature of D major is as we know



therefore the signature of B minor contains the same two little sharps. When we come to Fairy A however, we find that she is not in her place for at the last minute she yields to little Goblin A $\sharp$  and he hangs his ear on the staff telling us our loved semitone between the seventh and eighth degrees is not wanting and we are playing the scale of B minor and not D major



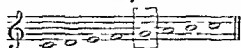
Next we have to discover what the left hand deems best in these two scales—B major and B minor. It has quite a new thought and it is this that the fourth finger is to find its home on the fifth note of both scales in this way



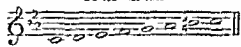
So we have found out a great many of the fairy ladders, and we have also

discovered that every major scale has its tonic minor—that is the minor with the same tonic or keynote also its relative minor—that is the minor scale starting on the sixth note of the given major and bearing the same key signature as that major scale. So we can arrange our fairy ladder in groups of three 1 major 2 tonic minor 3 relative minor. Here are examples

## C MAJOR

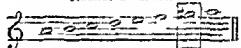


## TONIC MINOR



THREE FLATS MORE IN THE SIGNATURE

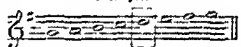
## RELATIVE MINOR



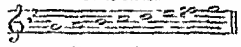
THE SAME SIGNATURE AS ITS RELATIVE MAJOR

DISTINGUISHING NOTE G $\flat$

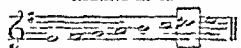
## G MAJOR



## TONIC MINOR



## RELATIVE MINOR



DISTINGUISHING NOTE D $\sharp$

The fairies thank we are now quite ready to go on arranging the remaining scales in their groups of three just in this way. We may also look back at all we have been learning about these fairy ladders and, at the right footing as well as the right notes.

If we continue to practise carefully, first very slowly, then gradually—but very gradually—quicker we shall be well on the way to running up and down our ladders of tone as gracefully and evenly as the most famous waltz to

We can only add quantities together when they are quantities of the same sort. Here we have 4 fractions which have different names, such as "thirds," "sevenths." Our first step must therefore be to express them all as fractions with the same name, that is, we must make them have a common denominator. We already know how to do this. The L.C.M. of 3, 7, 21, 3, 42 is 42. We arrange the work as shown here, using the sign + to

$$\frac{7}{3} + \frac{8}{7} + \frac{3}{21} + \frac{5}{42}$$

$$= \frac{18 + 16 + 28 + 5}{42}$$

$$= \frac{67}{42} = 1\frac{25}{42}$$

denote addition, and writing the common denominator only once, instead of putting it under each numerator. In working the sum we say: 7 into 42, 6. Then 6 times 3, 18. Write 18 for the first numerator. Proceeding in the same way, we get 16, 28, 5 for the others. We have now to add these together. The total is 67. Thus, the sum of our fractions is  $1\frac{25}{42}$ , or bringing this to a mixed number,  $1\frac{25}{42}$ .

EXAMPLE: Find the value of  $1\frac{3}{4} + \frac{5}{8} + 3\frac{7}{8} + 5\frac{1}{4}$ .

$$1\frac{3}{4} + \frac{5}{8} + 3\frac{7}{8} + 5\frac{1}{4}$$

$$= 9 + \frac{27 + 40 + 14 + 18}{72}$$

$$= 9 + \frac{99}{72} = 9 + 1\frac{11}{8}$$

$$= 10\frac{11}{8}$$

When we have mixed numbers, we first add the whole numbers, which here total 9, and then proceed with the fractions in exactly the same way as before.

Their total is  $9\frac{99}{72}$ , or  $10\frac{11}{8}$ . Adding the 9 to this, and reducing  $\frac{99}{72}$  to its lowest terms, we obtain the result,  $10\frac{11}{8}$ .

Subtraction is worked in a similar way. EXAMPLE: Take  $\frac{5}{7}$  from  $1\frac{11}{14}$ .

$$1\frac{11}{14} - \frac{5}{7}$$

$$= \frac{33 - 25}{14}$$

$$= \frac{8}{14} = \frac{4}{7}$$

The common denominator is the L.C.M. of 14 and 7, which is found to be 14. The numerators then become 33 and 25. Subtracting 25 from 33 we get 8. Therefore, our result is  $\frac{8}{14}$ .

EXAMPLE: Find the value of  $7\frac{3}{4} - 3\frac{11}{14}$ .

$$7\frac{3}{4} - 3\frac{11}{14}$$

$$= 4 + \frac{3}{4} - \frac{11}{14}$$

$$= 4 + \frac{10 - 33}{42}$$

$$= 3 + \frac{55 - 33}{42}$$

$$= 3\frac{22}{42} = 3\frac{11}{21}$$

As in addition, we deal with the whole numbers first, taking 3 from 7. We are left with the problem of taking  $\frac{11}{14}$  from  $\frac{3}{4}$ . Arranging the work as shown, and bringing the fractions to a common denominator, we find that we cannot subtract the numerator, 33, of the second from the numerator, 10, of the first. We therefore call one of our 4 units 45 forty-fifths, and add it on to the 10 forty-fifths. This leaves us with 3 units, and 33 forty-fifths to take from 55 forty-fifths, which gives  $\frac{22}{42}$ . Thus the result of our sum is  $3\frac{11}{21}$ .

Of course, these are simple examples of the addition and subtraction of fractions, but any number of fractions, however large and complicated, are added or subtracted in the same way.

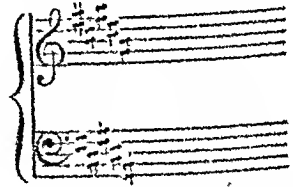
## MUSIC

### THE LAST OF OUR FAIRY LADDERS

THERE are still two more fairy ladders for us to know—B major and its tonic minor. If we use our memories, we shall recall a very important fact—that in all the scales with sharps, the last sharp is the seventh note—that is, the leading note of the scale. So as A $\sharp$  is the seventh note in B major, we know it is the new sharp, and the last one in this particular scale; therefore the sharp forming the signature will be between, and include, F $\sharp$  and A $\sharp$ .

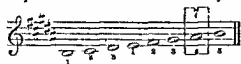
We also remember that the order in which the little sharp goblins proceed is by perfect fifths, so our

signature is F $\sharp$ , C $\sharp$ , G $\sharp$ , D $\sharp$ , A $\sharp$ , thus—

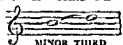


Now, what about the fingering? Well, the right hand has been thinking fondly of the first five major scales, C, G, D, A, E, and their tonic minors, and it has come to the conclusion that just for these two scales the old way

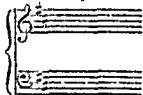
shall again be taken so the fourth finger of this right hand is to be found on A $\sharp$  the seventh note of both B major and B minor Here is B major



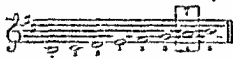
We also want to write B minor but first of all we must find its signature All we have to do is to find the relative major We walk up three semitones or a minor third and come to D



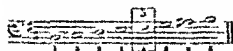
The signature of D major is as we know,



therefore the signature of B minor contains the same two little sharps When we come to Fairy A however we find that she is not in her place for at the last minute she yields to little Goblin A $\sharp$  and he hangs his card on the staff telling us our loved semitone between the seventh and eighth degrees is not wanting and we are playing the scale of B minor and not D major



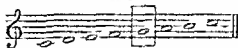
Next we have to discover what the left hand deems best in these two scales—B major and B minor It has quite a new thought and it is this that the fourth finger is to find its home on the fifth note of both scales in this way



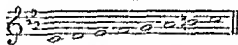
So we have found out a great many of the fairy ladders, and we have also

discovered that every major scale has its tonic minor—that is, the minor with the same tonic or keynote also its relative minor—that is the minor scale starting on the sixth note of the given major and bearing the same key signature as that major scale So we can arrange our fairy ladder in groups of three 1 major 2 tonic minor 3 relative minor Here are examples

## C MAJOR

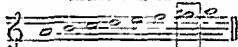


## TONIC MINOR



THREE FLATS MORE IN THE SIGNATURE

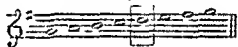
## RELATIVE MINOR



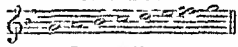
THE SAME SIGNATURE AS ITS RELATIVE MAJOR

DISTINGUISHING NOTE G $\sharp$

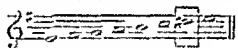
## G MAJOR



## TONIC MINOR



## RELATIVE MINOR

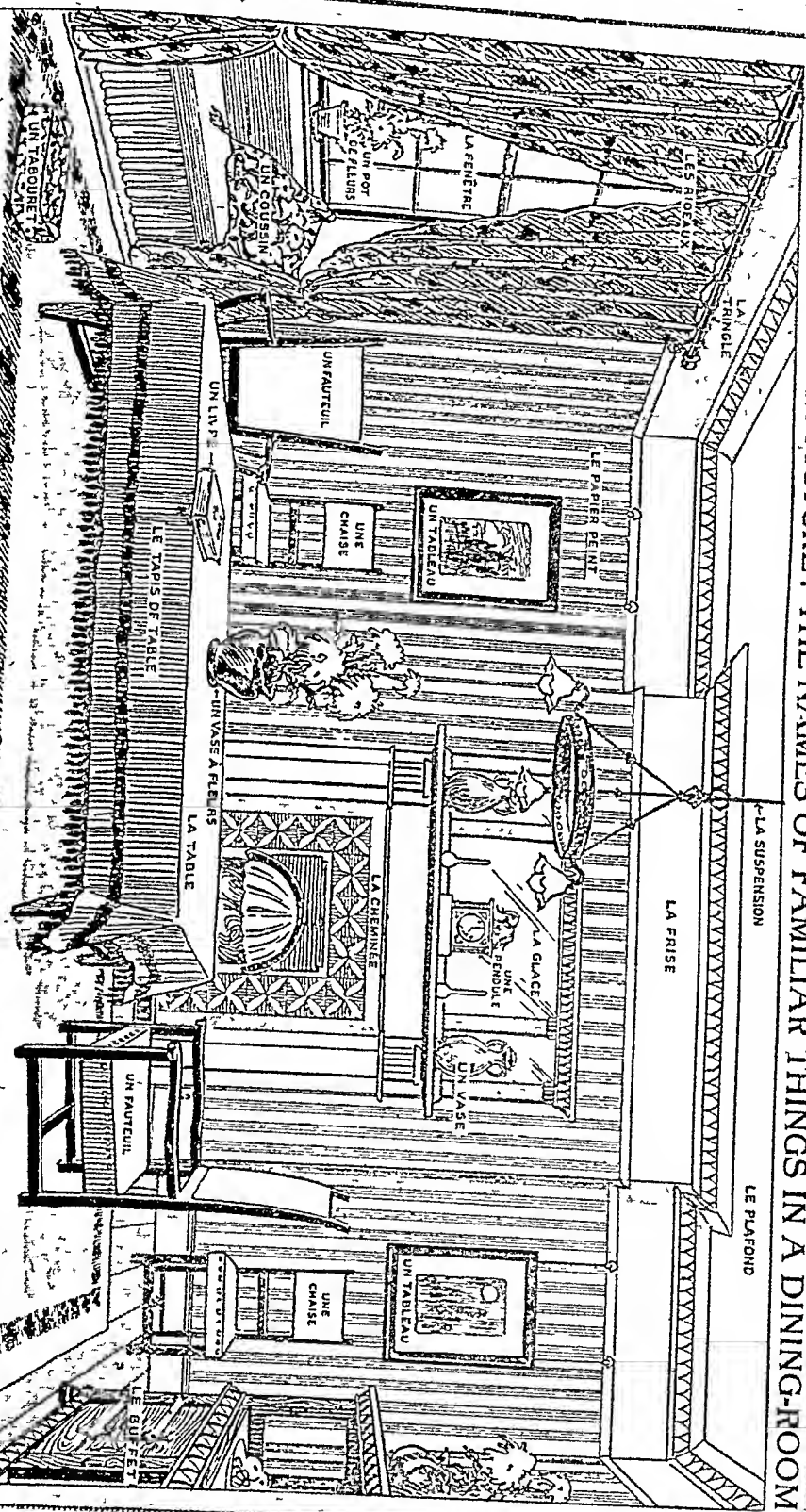


DISTINGUISHING NOTE D $\sharp$

The furies think we are now quite ready to go on arranging the remaining scales in their groups of three just in this way We may also look back at all we have been learning about these fairy ladders and put the right finger as well as the right notes

If we continue to practice carefully, first very slowly, then gradually—till very gradually—quicker we shall be well on a way to runn'g up and down our ladders of tone as quickly and evenly as the music furies want us to

# A FRENCH LESSON IN PICTURE: THE NAMES OF FAMILIAR THINGS IN A DINING-ROOM



This picture of a dining-room will help us to learn the French for the familiar things around us. The objects named are the ceiling, electric-light pendant, frieze, wall-paper, curtain-pole, curtains, looking-glass, clock, vase, fireplace, picture, chair, armchair, window, flower-pot, cushion, table, table-cloth, bowl, flower-vase, sideboard, footstool, carpets and flooring.



A stick insect that in colour and form looks almost exactly like the twig on which it sits

## ANIMALS WITH WONDERFUL COATS

THERE is an old joke known to nearly all of us who have been to a circus. Two clowns enter the ring and one says to the other: "Do you know how to catch a rabbit?" "Why how should I catch a rabbit?" asks the other. "The best way to catch a rabbit is to sit behind a hedge and make a noise like a turnip," says the first clown in reply.

Now none of us would play such a trick upon our friends as to say that in Nature's family creatures sit behind hedges and pretend to be turnips. That would be rather silly. But the idea of the old circus joke comes back to mind when we remember that insects perch on leaves and twigs and pretend to be leaves and twigs. Shall we say it tend to be? No that carries us too far. The wonder of the structure of the insects is sufficient as it is without our letting fancy run us into the danger of oversteering the bounds of common sense.

The leaf insect and the stick insect are among the most wonderful examples of what we call protective mimicry. But we must not say that the insect deliberately paints its own colour. It would be just as incorrect to say that the painter deliberately changes his feathers to white in winter, or that the mountain hare deliberately alters the colour of its winter coat to match the snow among



which it lives. It is by one of the great mysterious processes of Nature that these humble insects are able to make themselves like their surroundings and it is by the operation of the same law that the giraffe and the tiger are able to become invisible among their surroundings.

The great white bear of the Polar regions did not get his white fur by thinking that it would be better for him to have a coat matching the snow of his native land. Man is the only living creature that can deliberately do these things. Man has a mind. He remembers yesterday and last year and the years before that and he plans for the years that are to come. None of the creatures of the wilds are wise enough to copy the artist-plan. Man however copies the animals.

One of the things that the clever orders of creatures have taught us is protective mimicry. In the old days when our soldiers went forth to war they wore their glances and uniforms. These showed up distinctly against the grass and rocks among which they had to fight. Nowadays when we send out our soldiers in a late brown coat, like the khaki. And we're them in khaki instead of khaki—a material which takes the colour of the earth and rock. We even paint the large parts of the cars with khaki so that they shall

not glisten and prove a mark for the sharpshooters of the enemy. This is a recent change in war, but in the lives of the lower creatures it has been practised for perhaps millions of years.

It has not come suddenly. It was not done in a day or a night, nor in a year. Take the case of the humming-bird moth. That is so marvellously like the humming-bird that men have shot it in mistake for the bird. That seems rather a queer sort of "protection" for the moth. But those moths were there long before men and guns appeared. In the old days they were persecuted by insect-eating birds and other creatures. Then it would happen that one or two moths were born different from the others. They would be larger, and look a little like a bird. Their likeness to the bird and their larger size would lead to their being spared by birds, which mistook them for something else. Naturally, then, the young ones of these would be like their parents, and would have a better chance of rearing young ones.

#### **MOths THAT LIVE SAFELY BY PRE- TENDING TO BE BIRDS**

Gradually the moths that were like birds, always mating with other moths like themselves, would become a definite species. They would survive the perils which the others were unable to avoid. The old stock—the moths which looked simply like moths—would die out. They would find it impossible to live, because the more the other moths increased, the more would those of the original type be sought as food. So in course of time the first strain would become extinct, and those which had imitated the humming-birds would possess the whole part of the country where the others had been. They would survive, because they were the fittest to survive, because, by unconsciously imitating birds, they had deceived their enemies.

And what is true of the gradual formation of the species of humming-bird moths is true also of the other wonderful creatures which live by trickery. Their art is the outcome of ages and ages of development. The improvement has come little by little, and the change of form, very slowly effected, has become permanent, because it is necessary for the very life of the creature benefited by it. That is the thing we have all to remember—that

these resemblances of forms of animal life to their surroundings, or to other and better-protected forms of life, are always brought about because they are necessary for the well-being of the creatures affected. There is a cause for everything that happens in Nature, of which all who will may discover at least something.

#### **WHY ONE BIRD BECOMES WHITE IN WINTER, AND ANOTHER REMAINS BLACK**

Those of us who have followed the CHILD'S BOOK OF NATURE from the beginning to the present point have noticed repeated instances of the manner in which animals, birds, fishes, reptiles, and insects are safeguarded in this way. On the other hand, careful observers will have noted that there are striking exceptions. It is only fair, when we are stating a general and important rule, that we should grapple, as far as we are able, with the difficulties which exceptions seem to present. Let us see if we can answer, in advance, some of the questions to which this story may give rise.

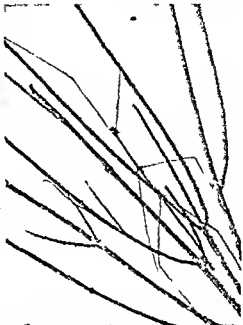
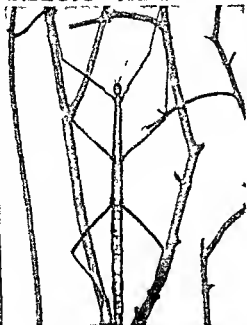
Why should a ptarmigan be able to change its plumage to pure white amid the snows of the Highland winter, when the relatives in the Arctic snow of our friends, the ravens, have to show themselves in glossy black, winter and summer? That is a fair question. The answer seems to be this: that the ptarmigan has need of its white plumage in winter so that it may seek its food in safety upon the moors and hills, without being discovered by its enemies, as it quickly would be, were it to wear its summer garb of coloured feathers. The raven, on the other hand, does not seek its food from things growing upon the ground. It feeds on carrion, and is free to fly wheresoever it will. Therefore, it is not in need of protection such as is necessary for the very life of the ptarmigan. It need not fear death through being plainly visible on the snow.

#### **WHY THE SABLE DOES NOT CHANGE HIS BROWN COAT IN THE SNOW**

A stronger contrast, however, is presented by the Polar bear and the sable. The Polar bear lives in the Arctic regions, and the sable lives in bitterly cold Siberia. Siberia has a generous summer, but the cold there brings snow and ice in winter almost as bad as that of the Arctic regions. Why, then, cannot the sable change his coat to white in



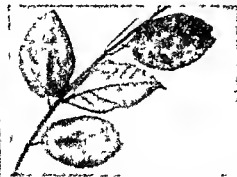
# INSECTS THAT PRETEND TO BE PLANTS



The stick insects are among the greatest marvels of Nature. As we may see from this one that is common in Ceylon, the creatures bear a remarkable resemblance to the twigs of the trees in which they rest. Some of the stick insects stirle in holes and yet so closely do they imitate twigs that it is often impossible to discover them even when looking straight at them. The picture shows a stick insect of the kind.



Some of the large stick insects are found in the U.S., but quite wonderful is another I just found in that country that not only resembles the thorns of the plants on which it rests, but may be seen in the picture.



The Indian leaf butterfly never leaves the upper surface of its wings very gaudy and conspicuous, but when it rests it closes its wings, and is then, in shape and colour, almost an exact copy of a waxy leaf.

There is a small black butterfly which always resembles a knot as they are seen here. It is known to be an expert in order to avoid being found by when within some of the many holes where they are quickly found.

winter, instead of living always in the rich brown fur which is so famous and so costly? The Arctic fox and the ermine, like the bear, change their coats. The Polar bear, indeed, is white all the year round, the only bear to enjoy this distinction. Snow and frozen waters are always to be found in the Arctic regions, winter and summer, hence it would be a disadvantage for the Polar bear which seeks seals and fish, to change his coat in summer. The Arctic fox, on the other hand, strays farther from the sea with its ice, and from the fields which are always covered with snow, so that it is to his advantage to change his colour with the seasons.

How, then, about the sable? The reason that he does not alter his colour in winter or summer is this: when snow and ice abound in winter, the sable has to seek his living in the bushes and trees. He is very hungry, and eats a vegetable and meat diet. In the bushes and trees he finds berries which help to make up his meal. He is thankful for these, but still more welcome to him are the birds which he is able to catch.

#### HOW THE CUNNING SABLE HIDES IN THE TREES AND CATCHES BIRDS

Now, if the coat of the sable were white, like the snow, he would be easily detected as he creeps along the branches. With his brown fur, however, he is not readily distinguished from the trees and bushes along which he makes his way. Therefore, being so protected from observation, he is able to pounce upon unwary birds that would otherwise be beyond his reach. His colour is the means of his being able to get the food necessary for his existence. If he were white, very likely he would starve, for the berries alone would not suffice to feed him.

Then there is the musk-ox, whose dingy, shaggy coat is always plainly seen against the snow—whence comes his protection from colour? The plainness with which he can be seen is not a source of danger to him, but of protection. Left alone, a musk-ox, gallantly as he might fight, would soon become the prey of savage, hungry animals. He may be brave, but he cannot alone resist the attacks of animals with powerful, tearing teeth. But a herd of musk-ox together might defy quite powerful enemies. Therefore, in case of

danger, it is necessary that the musk-ox should be able readily to see his comrades, so that he may rush to them. He can easily see them in their dark coats, but he could not if their coats were white like the snow.

#### A WONDERFUL INSECT THAT CAN MAKE ITSELF LOOK LIKE A LEAF

Having answered these questions, let us return to our insects, and see if the marvels of the leaf insects and stick insects stand alone in the story of Nature's miracles. We shall soon find that they do not. The leaf insects and stick insects seem to have reached the highest stage of perfection in protective mimicry, but the defences of other weak little creatures are found equally wonderful in their way. But let us first discuss these wonderful stick and leaf insects.

A curious thing is the way in which the natives are deceived by the leaf insect. Its home is in the hot countries; it is found, for example, in perfection in Ceylon. Now, the eyesight of natives is generally sharper than that of Europeans. Living a savage or partly savage life, they become very keen-sighted, for their success in gaining food depends very largely upon the keenness of their vision. If, then, the leaf insect manages to deceive the native hunters, we may rest assured that it is indeed a wonderful creature.

And it does deceive them completely. They believe that the leaf insect is really part of the plant on which they discover it. It grows like a leaf, they say, and is really part of the leaf for the early stages of its life, and then, when it reaches maturity, it loosens itself from the plant and flies away. Of course, that is a mistake. A tree or plant may feed an insect, but life comes from the Power which created the tree. We might just as well say that the caterpillar of the clothes-moth is created by the cloth or fur in which it is born. But we can forgive the natives for their error.

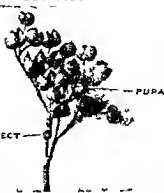
#### HOW THE LEAF INSECT DECEIVS THE CLEVEREST OF MEN

When English naturalists first studied the leaf insects, they said "To such perfection has Nature carried her arts in these insects, that you would declare, upon seeing some of the insects, that they had robbed the trees of their leaves to form for themselves artificial wings,

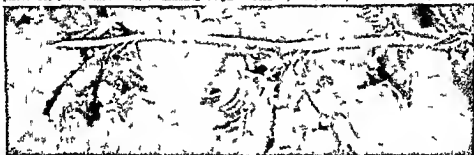
# HOW INSECTS DECEIVE THEIR ENEMIES



Some of our British caterpillars, like that of the wax moth shown here, are known as stick caterpillars because of their habit of imitating twigs.



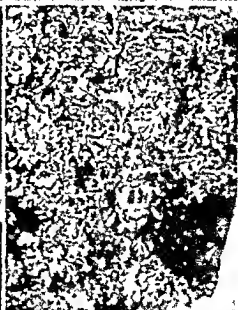
A little English beetle feeds upon the leaves of figwort, spins a cocoon for its pupa, and so the pupa of the beetle that resembles a seed of the plant does its work.



The comma butterfly, which gets its name from a white mark like a comma on its wing, is a most natural becoming scarce in Britain. The underside of the wings carries through all the browns and dull greys of faded leaves, and when the butterfly is at rest, as shown here, it is difficult to distinguish it from a dead leaf.



This leaf hound from Ceylon exactly resembles a leaf and may be at any time and place, some leaf in its markings, which are just like the veins of a leaf.



Some leaves resemble the leaf and in some cases they eat. These are two such leaves from the East Indies which are difficult to distinguish from the leaf.

so exactly do they resemble them in their substance and internal structure." Stick insects and leaf insects belong to the same family, but there is the same sort of difference between the two species that there is between the centipedes and the millipedes. The body of the stick insect is narrow, and shaped like a cylinder, the body of the leaf insect is broad and flat. The leaf insect is coloured exactly like the leaves among which it rests. The abdomen is broad and flat, and green or dark yellow. If it lives among green leaves, the body will be found to be green, if the leaves be withering, the leaf insect will look just the same colour as the foliage dried up and withered, as it seems. The legs are broad and leaf-like, so that they pass for parts of the leaves. But perhaps the wings are the most wonderful. In every respect they resemble the leaf of a tree or shrub.

Let us study the picture of the green insect from Ceylon on page 341. We can hardly tell where the real leaf ends and the insect begins. Down the centre there appears to be the main nervure of the leaf, and branching off to right and left there seem to be lesser nervures. The shading of the wing-sheaths is exactly like that of the leaf.

**THE LEAF INSECT'S WINGS THAT CHANGE COLOUR LIKE A DYING LEAF**

How does the insect get this extraordinary resemblance to the leaf? The trick is effected by Nature, by means which might seem almost to justify the mistake of the natives. The colouring is the result of what is known as chlorophyll, which is the green colouring matter of plants. The formation of the elytra, or wing-sheaths, is similar to the construction of the leaf of the plant. The resemblance is not only on the surface, but, more wonderful, in the internal structure of the insect. Even when the life of the insect ends, the resemblance does not depart. One such insect which has passed its life among green leaves would always remain, when alive, green like the plants, but when it dies, the body of the insect changes colour exactly like a dead leaf.

The food of the leaf insect which we have been considering is the leaf which it resembles. But there is another species of leaf insect which

does not rely upon this sort of diet. This one, which flourishes in Mozambique, is a flesh-eater. Its food consists of butterflies and other insects. So the insect has to practise to deceive its victims into the belief that it is something else than a hungry, carnivorous animal. Thus it manages to do by imitating the orchid.

**A INSECT THAT PRETENDS TO BE A FLOWER AND FEEDS ON BUTTERFLIES**

Its colour and form resemble the flower of a beautiful orchid. It settles upon an orchid and rests quite still. Butterflies approach in the belief that the insect forms part of the orchid from which they desire to extract nectar. In an instant the insect starts up, catches the butterfly, and eats it.

These two species of insects give us the story in a nutshell of the whole scheme of mimicry. One is coloured to resemble plants, so that it may escape the attacks of stronger creatures which would destroy it. The other is coloured to resemble a flower, so that it may be mistaken for something quite harmless by creatures upon which it depends for food. And throughout wild Nature this plan works in these two directions. The lion and tiger are coloured to resemble their surroundings so that their intended victims may not see them, the humming-bird moth and the leaf insects, and all the lesser creatures that need protection, are coloured and shaped so that they may go their way through life always being mistaken for something else by the things that would eat them.

After having admired the wonders of the leaf insect we cannot be more astonished by other creatures, but we have to admit that the claims upon our admiration of the stick insects are just as strong. They are as marvellously protected in their way as leaf insects are.

**A WONDERFUL INSECT THAT RESTS IN A TREE AND DISAPPEARS BEFORE OUR EYES**

In fact, some of them might fairly challenge the leaf insects for the right to be considered the best actors in Nature. Think of a great insect thirteen inches long—three inches longer than this page—resting on a shrub within a few inches of our eyes and being invisible, though fully exposed to view. There is the insect, right before us, but we peer and turn about.

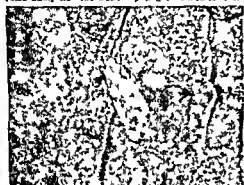
## MOTHS HIDING FROM THEIR FOES



Moths are mostly creatures of the night, but when they appear in daylight they escape from enemies by their resemblance to their surroundings. This shark moth is remarkably like the wood-pile grey which it eats.



The small grey moth in the picture is grey and brown so cleverly mottled with dark shades, as it rests on a oak paling it looks exactly like a patch of lichen, another natural discoloration of the wood.



The grey-bellied hawkmoth, however, is at home in autumn. It is pale grey with black markings, and its colour so harmonious with the trunk of the oak on which it rests that it is seen only by close scrutiny.



The marvelous war moth is a bright green and white with black markings, but it passes unnoticed by its enemies because its pattern of bright green like a tree-trunk, with which its grey colours harmonize.



The caterpillar of the red underwing moth is so like the trunk of the poplar on which it lives that it is discovered by touch more often than by sight.



The diamond moth with black and white spots on its wings is very large and handsome when its wings are expanded in flight. Its upper wings that show when at rest resemble a tree-trunk or a mottled leaf.



The dark dagger moth has a very like the common grey dagger is hard to detect even when it is conspicuous by its surrounding when at rest.

to discover it, and peep in vain. A gentleman who had a couple of these insects alive took some friends to see them. He took them close to a tree. "There they are," he said, "they are both there," and he nodded his head in the direction of the tree. The friends stared until their eyes ached, then turned to him with a smile, thinking that he was playing a trick on them. "I assure you that they are there, right before your eyes," he said.

#### THE WONDER OF THE STICK INSECTS THAT ARE SEEN AND YET UNSEEN

They gave it up, and though they were close up to the tree, he had to point with his finger to the insects before the untamed eyes of his friends could discover them. Once he had touched them the stick insects were plainly visible. But how wonderful that people who had gone out solely to see them, and had stood close to them, should be unable to tell them from the twigs of the tree! So it was, and so Nature intended that it should be.

Of course, if the insects were flying, they would be readily seen. Not all of the species have wings, but some have two pairs of wings, a small pair in front and a larger pair at the rear. But here we have cause for more wonder. When the wings are open, it is found that the hinder pair have half their surface brightly coloured, while the other half is quite plain. The extended wings, so gay and handsome, are easily to be seen. But the insect comes to rest as we watch, and, lo! there is nothing to be seen. We see twigs and stems, but no insect. Where is the brightly coloured insect which we saw flying a moment ago? The explanation is that the smaller pair of wings is folded down over the front part of the hinder wings, and looks just like the rest of the body. The second pair of wings, however, shows no colour, they cannot be distinguished from the rest of the body.

#### A MARVELLOUS TRANSFORMATION SCENE IN AN INSECT'S LIFE

Now we understand why half the lower wings are coloured and half plain. The coloured part is folded up and covered by the half which is plain, and now not the sharpest eye could detect the presence of wings at all. Instead of a gorgeous, winged insect which we saw a moment ago, we see what

looks like a little branch of the shrub or tree. The whole body is long, slender, and round, and coloured like the wood of the tree. But the insect has long legs; how is it to dispose of these? The legs help to deceive, instead of betraying their owner. They are themselves shaped like twigs, and as we look at the insect we fancy that the body is a stoutish stem and the legs are merely thinner twigs branching out in different directions from an older stem.

So long as it remains still, the insect is not to be seen. When it moves, it is so remarkable in appearance that it well deserves its title of the "walking stick." Its home is on shrubs, or among undergrowth, or on the stems of tall grass. It rests by day and seeks its food by night, hence its life is probably as safe as that of anything in the insect world.

These two insects, being naturally sluggish in character, may be said to be specially favoured in their struggle for existence. The less they wander about, the less they are likely to be seen and caught. But there are other insects whose lives depend upon their getting about the world. They must find food for themselves, and they must find a suitable place in which to lay their eggs, or their race would perish.

#### HOW NATURE PROTECTS THE LIVES OF BUTTERFLIES AND MOTHS

The means of protection in their case is just as effective. We find this specially so in the case of moths and butterflies. We have studied this subject already, but as we have a picture of the famous leaf butterfly, we may refer to the matter again. Here is a beautiful butterfly which, when it is flying, is handsome as can be. But when it settles to rest on a tree, not the keenest human eye would readily find it. It raises its wings and brings them together, and there we have what appears one of the ordinary leaves of the tree. Its relative, the dead-leaf butterfly, chooses resting-places where its appearance suggests that it is a leaf which has died.

Luckily, we have not to go to India, or even to the Zoo, for these remarkable sights, we may find a splendid example in our English lappet moth. The moths fold their wings differently from the butterflies, not up, but flat down on the back

Now this means a serious difference in the scheme of protection for the two. The butterfly as he shows the under side of his wings when at rest must have that side soberly coloured and the gaudy hues all on top. The moth on the other hand showing the upper side of the wings when at rest must be coloured underneath not on the upper surface or when he settled down to rest his life would not be worth ten minutes purchase as we say.

The hippet moth is not content to be merely soberly coloured on top of his wings. He is so formed that when he rests he looks exactly like a little cluster of dead leaves. Then we must not forget that there are moths and butterflies that resemble wasps and bees so that avoided by insect eating creatures which fear the sting of the wasp and the bee they escape destruction by their deceit.

**INSECTS THAT LOOK LIKE THORNS AND BEETLES THAT LOOK LIKE MOSS**

On page 3409 is a picture of a Brazilian insect which living among trees bearing thorns looks so marvellously like a thorn itself that though our photograph is taken at short range we should hardly be able to tell the insect from the true thorn unless it were marked for us on the picture. Mosses and lichens serve as homes for many insects as well as for coverings for the homes of clever birds which use moss and lichen to adorn and hide their nests. In the East Indies they have beetles which are coloured exactly like moss and there is another creature like a stick insect called the moss insect which looks exactly like a branching twig of some plant over which moss has grown.

We have been studying how insects are protected by natural colouring and disguise. Somewhere in their family history there must have been definite acts of selection—the deliberate choice by females of mates whose shape and colouring made them most like the surroundings. The result has been that their successors have become more and more like the leaves and twigs and moss among which they make their dwellings or in which they are like the other insects in their usually exposed. The same sort of thing is certainly going on to day.

The insects that are best protected in this way are the insects that have the best chance of escaping hungry enemies and so of rearing families of their own. The creatures that imitate other creatures have just the same sense of security from their disguise.

**LIVING THINGS THAT ARE NOT WHAT THEY SEEM**

The moths and butterflies that most nearly imitate things having an unpleasant taste and therefore not likely to be eaten are the most daring of their family. They fly without haste and without care in the sunlight or in the light of evening, where insect eating birds abound. They know that they need not fear because by their appearance they are deceiving their enemies into believing that they are not good for food. The butterflies and moths are not the only forms of animal life to do this of course. There is a winged bug which goes about disguised as a hornet, there is a caterpillar which pretends to be a stick, there is a timid little oriole which has managed to make itself like the powerful frill bird and so escapes. The cuckoo wears something the look of the fierce parrow hawk and by its formidable appearance is able to frighten from their nests the little birds among whose eggs the cuckoo determines to place her own.

Few of us would at first thought suspect the frog of protection of this sort. We know that our toads and frogs in this country if they rest still in their abiding place are very hard to distinguish from their surroundings. But we know also that they are bound to hide and to mask their eyes in this manner lest they should be gobbled up by duck or other bird that like frogs and toads. But there is one little frog in San Den who that does not hide.

**A LITTLE FROG WITH A RED COAT THAT IS AFRAID OF NOTHING**

Among the green and blue leaves and green leaves or rose hedges or beds of earth this dainty little frog hops about among the enemies of frogs as comfortably as if he were one of the whole lot. The others are not moved by day and night but this one is out as gay as ever and at all times he is in his place in the broad day light. A naturalist who was puzzled by this could not understand the reason and

gave them to his poultry. The birds, though they liked ordinary frogs, would not touch these scarlet-coated creatures. At last, however, by throwing down meat, for which the birds eagerly scrambled, the gentleman managed to get a duck to snatch up one of the frogs. But in an instant the duck dropped it, and ran about holding its head as if something horrible had entered its mouth. That is why that bold little frog goes out by daylight, fearless of birds and snakes and all the other enemies of frogs—it tastes too bad to be eaten and it is therefore afraid of nothing.

This case, like the others, is one in which the protection is afforded by Nature. There are cases, however, where the insect has to take means of protection just as the caddis worm, the crab, and the hermit crab have to. There is a little insect that lives on the fig-wort which, when it spins its cocoon and enters the pupa stage, becomes, of course, entirely defenceless, and unable to run away from any enemy which may threaten it. But the wise little creature makes its cocoon so much like the seed of the fig-wort that it escapes detection.

#### AN INSECT THAT DRESSES IN A DIRTY COAT AND PLAYS THE BOGEY MAN

Even that is not so strange as the ticks of an insect called the *reduvius personatus*. This insect, in its perfect state, has wings, but in its early life it has not. In these early days, then, it is exposed to many perils. What is it to do to escape? It does the strangest thing. It drags itself through the old webs of spiders, covers itself with web and dust, and makes itself a monstrous size and most unpleasant in appearance. It is really the bogey man of insects. In this disguise it is quite secure. When the time comes for it to have wings, and so be safe, it brushes off the covering of dirt and web, and comes forth quite a neat and handsome insect.

But it is not by mimicry alone that insects are protected. Some of them are worse than our spitting friend, the llama—they shoot out acid. The most famous of these marksmen is the bombardier beetle, which, when threatened, squirts from its body a liquid which resembles nitric acid. Not only can it shoot strongly, it can make a report with its shooting like the tiniest of tiny guns. This report, which must sound

quite loud to the senses of an attacking insect, is at once taken up by the whole family of bombardiers who may happen to be on the spot at the time, and away they fire, bang! bang! bang! as if the intruder had stumbled upon a whole battery of insect cannons. The bombardier can fire from twelve to twenty shots in succession, and after a rest is ready for another cannonade.

#### SPIDERS THAT PRETEND TO BE DEAD AND CATERPILLARS THAT THROW OUT POISON

This is a very effective weapon, and it serves the bombardier and other creatures that practise it in the place of the power to sign death. Perhaps the spiders are the finest masters and mistresses of the latter art. They curl up in an instant if threatened, and will rest under the closest examination, looking as dead as a door-nail.

The caterpillar of the puss moth should be handled with extreme care, for it possesses in exceptional degree the power to squirt forth its hateful poison. One day a gentleman who did not heed this fact went to look at some puss moth caterpillars which he had put away in a box with some leaves of the sort that they like. The moment he raised the lid, one of the caterpillars squirted forth a jet of acid which entered the right eye of the gentleman. He felt the most dreadful pain, and had to rush away for a doctor, who told him that the poison was very powerful indeed, and such as seriously to injure the eyeball. The pain lasted for several hours, and not for days after was he able to see properly.

Some caterpillars that cannot squirt acid are armed with hairs that produce an irritating rash upon us if we get them on the face or body. The hairs are the armour of those caterpillars, and serve so well for defence that the cuckoo is practically the only bird in England which will eat them.

#### THE PROTECTING CARE OF NATURE OVER ALL HER CHILDREN

Such, then, are some of the ways in which Nature protects the humblest of her children. The same thing happens in the desert as in the tropical forest, in the snows of the Arctic regions, and in the warm seas of the tropics. Everywhere we find the same rule in force for the benefit of wild animal life.

The next stories of Nature are on 3583



## THE BEGGAR MAN

The name of J. B. Lamb is not familiar one literature but, his brother and sister he also had a taste for poetry and the following poem, which is typical of the manner of his time, is written by him, as we know from a letter by Charles Lamb. J. B. Lamb died November 3

**A**BJECT stooping old, and wan  
See von wretched beggar man  
Once a father's hopeful heir  
Once a mother's tender care  
When too young to understand  
He but scorched his little hand  
By the candle's flaming light  
Attracted dancing spurs bright  
Clasping fond her darling round  
A thousand kisses healed the wound  
No y abject stooping old, and wan  
No mother tends the beggar man.

Then nought too good for him to wear  
With cherub face and flaxen hair  
In fancy's choicest gauze arrayed  
Cap of lace with rose to aid  
Milk white hat and fether blue  
Slaves of steel and coral too  
With sil'ly bells to please his ear  
And charm the first quick ready tear  
Now abject stooping, old and wan  
Selected is the beggar man

See the boy advance in age  
And Learning spreads her vict'rous page  
In vain! for gaily I treasure eol!  
And show the marbles, toys and baubles  
What's learn'd, to the charms of play?  
Th' instructive tutor must give way  
A heedless wifely dote and maid  
The parrots fondness spoils the stud  
The youth in wanton courses ran  
Now alect torp'rous, old and wan,  
Th' r. sounding is the longer man

## THE CHILDREN'S HOUR

[illegible]

Between the dark and the distant mountain  
It is beginning to grow  
Come in a pause in the day's occupations, that  
is known as the Golden Hour  
I hear in the song of a bird the true poet of  
the life  
The world of a man that is equal and  
a secret and sweet

From my tale I see in the morning  
 descending the road and start  
 (as a voice to John of Virginia and Pitt  
 who is given his  
 'We' yet and then a new yet I know why  
 that is. )  
 There are just a and planting together  
 take me to see

[illegible]

They almost devour it, with knees their  
arms about me entwined  
Till I think of the Bishop of Bergen, in his  
Mouse tower on the Rhine  
Do you think, oh Nibelung banister because  
you have scaled it the wall  
Such an idiom taught as I am in a mate  
for you all?

I have you fast in my fates and will not  
let you depart  
But put you down into the noon on the  
round tower of my heart  
And there will I keep you free yes for  
ever and a day  
Till the walls half crumble to ruin and  
moulder in dust away

## HOW TO WRITE A LETTER

In the very year of his century when billions have  
 taken the fact of his existence for granted, Mrs. Kier  
 Turner was one of those with whom the  
 cause of the poor and the weak was  
 a primary concern. Her life of today would be  
 more like a human pyramid than a life of today.  
 The famous names by Mrs. Turner were  
 happy days for the people of the first period of  
 the world. Mrs. Turner was one of the great  
 builders. Mrs. Turner was one of the great

Maxie ant asked a letter to write  
I ut could not be in (a be thought) to

So went to her mother with period and knife  
containing. Dear Sir and also a late

With nothing to say my daughter don't  
thru

Of waiting your time over paper and ink  
but certainly this is an excellent way  
To try with your lat to find what this is

I will give you a rub and let me know  
"my dear"

Just think for a moment your water is here  
and what would you tell her? Come on and

Though you're your tongue, you can't speak  
in the your way

**GOD SENDS LOVE TO YOU**

[illegible]

Also a tree  $T_2$  with  $x$  as the largest leaf.

1. The Commission is not aware of any other persons who have been convicted of a crime involving the same or similar conduct as the crime committed by the defendant.

The system with the  
like is an error and the  
for a very long time  
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the same is the case of

12. If any one of the following is true, then the other two are false.

U.S. is a ... the ... of the ...

F. A. Brown, Jr., Sec'y. 1000 N. 1st St. N. W.  
 Wash., D. C. 20004

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- 1. The first part of the document is a list of names and their corresponding numbers, arranged in a grid-like fashion. The names are written in a cursive script, and the numbers are written in a more formal, printed style. The names are:

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"So blow, ye stormy winds—  
And ye flames, ascend on high;  
In easy, idle bed

Let the slave and coward die!  
But give me the driving keel,  
Clang of shields and flashing steel,  
Or my foot on foreign ground  
With my enemies round!

Happily, happy, thus I'd yield,  
On the deck or in the field,  
My last breath, shouting 'On  
To victory!  
But since this has been denied  
They shall say that I have died  
Without flinching like a man  
Of the sea!"

And Balder spoke no more,  
And no sound escaped his lip,  
And he looked, yet scarce he saw  
The destruction of his ship,  
Nor the deck-sparks mounting high,  
Nor the glare upon the sky,  
Nor the burning timber crash,  
Scarcely felt the scorching heat  
That was gathering at his feet,  
Nor the fierce flames mounting o'er him  
Greedily,

But the life was in him yet,  
And the courage to forget  
All his pain, in his triumph  
On the sea

Once alone, a cry arose,  
Half of anguish, half of pride,  
As he sprang upon his feet,  
With the flames on every side,  
"I am coming!" said the king,  
"Where the swords and bucklers ring—  
Where the warrior lives again—  
Where the souls of mighty men—  
Where the weary find repose,  
And the red wine ever flows  
I am coming, great All-Father,  
Unto Thee!  
Unto Odin, unto Thor,  
And the strong, true hearts of yore—  
I am coming to Valhalla,  
O'er the sea!"

### THE BLIND BOY AT PLAY

On page 2479 the well known poem "King Bruce and the Spider," by Eliza Cook, is printed, and here we give another poem of a different character by the same author. It illustrates in simple but effective style the blessing of sight, for which we are not always sufficiently thankful until we thus realise how terrible is the loss of that precious faculty.

The blind boy's been at play, mother,  
The merry games we had!  
We led him on his way, mother,  
And every step was glad  
But when we found a stony flower,  
And praised its varied hue,  
A tear came trembling down his cheek,  
Just like a drop of dew

We took him to the mill, mother,  
Where falling waters made  
A rainbow on the hills, mother,  
As golden sun-rays played,  
But when we shouted at the scene,  
And hailed the clear blue sky,  
He stood quite still upon the bank,  
And breathed a long, long sigh

We asked him why he wept, mother,  
Where'er we found the spots  
Where periwinkles crept, mother,  
O'er wild forget-me-nots.  
"Ah, me!" he said, while tears ran  
down  
As fast as summer showers,  
"It is because I cannot see  
The sunshine and the flowers!"

Oh, that poor sightless boy, mother,  
He taught me that I'm blest,  
For I can look with joy, mother,  
On all I love the best  
And when I see the dancing stream,  
And daisies red and white,  
I kneel upon the meadow sod,  
And thank my God for sight

### THE LAME BROTHER

Mary Lamb, the sister of Charles Lamb, had a very sad life, and was subject to fits of mania. Her brother Charles devoted himself to watching over her and protecting her. Their literary labours together did much to brighten and make useful the life of the sister, who, though greatly inferior to her brother in literary gifts, had still a talent for pleasant and simple verse. Their elder brother, John, had been lame in his youth, and these verses by Mary Lamb were, no doubt, suggested by the infirmity of her brother.

My parents sleep both in one grave,  
My only friend's a brother  
The dearest things upon the earth  
We are to one another

A fine stout boy I knew him once,  
With active form and limb,  
Where'er he leaped, or jumped, or ran,  
Oh, I was proud of him!

He leaped too far, he got a hurt,  
He now does limping go—  
When I think on his active days,  
My heart is full of woe

He leans on me, when we to school  
Do every morning walk,  
I cheer him on his weary way,  
He loves to hear my talk

The theme of which is mostly this,  
What things he once could do.  
He listens pleased—then sadly says,  
"Sister, I lean on you"

Then I reply, "Indeed you're not  
Scarce any weight at all—  
And let us now still younger years  
To memory recall

"Led by your little elder hand,  
I learned to walk alone,  
Careful you used to be of me,  
My little brother John

"How often, when my young feet tired,  
You've carried me a mile!  
And still together we can sit,  
And rest a little while

"For our kind Master never minds,  
If we're the very last,  
He bids us never tire ourselves  
With walking on too fast"

## THE BEGGAR MAN

The name of John Lamb is not so rare as it might seem, but it is a name that is not often heard. He is a man of many talents, and he is a man of many virtues. He is a man of many talents, and he is a man of many virtues. He is a man of many talents, and he is a man of many virtues.

**A**bject stooping old and wan  
 See you wretched beggar man  
 Once a father's hopeful heir  
 Once a mother's tender care  
 When too young to understand  
 He but scorched his little hand !  
 By the candle's flaming light  
 Attracted dancing spiral bright  
 Clinging fond her darling round  
 A thousand kisses healed the wound  
 Now abject stooping old and wan  
 No mother tends the beggar man

Then nought too good for him to wear  
With clerical face and flaxen hair  
In lacy a choi t gards arrayed  
Cap of lace with rose to add  
Milk white hat and feath r blue  
Shoes of red and coral hue  
With star bulls to please his ear  
And charm the frequent rudy tear  
New abjct tooing old and new  
Neglected is the vulgar man

So the boy advances in age  
And Learning sure is his useful page  
In vain for giddy pleasure eels  
And shows the marbles up and balls.  
What a learning to the charms of play?  
The indulgent father must give way  
A heedless wild dance and will  
The parent fondness spoiled the child  
He youth in vagrant courses ran  
Now a subject stopping old and wan  
Thy son him is the lecher man

## THE CHILDREN'S HOUR

[illegible]

Between the lark and the daylight when the night is beginning to lower  
Comes a pause in the day's occupations that is known as the Children's Hour  
I hear in the chamber above me the soft and sweet little feet,  
The sound of a door that is opened and voices soft and sweet.

From my study I see in the twilight  
dome, long the road hall fair  
I have Alice a beautiful & elegant and I with  
with gold in hair  
A whisper and then a silence yet I know  
thir merry eyes  
They are together and planning & gathering  
take me by surprise

A wall runs from the stairway a wall is  
as it is in the hall  
In the end of the wall is a doorway  
castle wall  
They came up into my turret over the arm  
and back of my wall  
If I try to escape they will see me  
as I am in the wall

They almost devour me with kisses  
 Turns about me entwined  
 Till I think of the Bohop of Bing u u lu  
 Mouse tower on the Rhin ?  
 Do you think of blue eyed banditti because  
 you have a scale in the wall  
 Such an old moustache as I am is not a match  
 for you all ?

I have you fit in my ( arms ) and will not  
let you depart  
But put you down into the dungeon in the  
round tower of my heart  
And there will I keep you for ever yes for  
ever and a day  
Till the walls fall crumble to ruin and  
moulder in dust away

## HOW TO WRITE A LETTER

[illegible]

**M**AKING intended a letter to write  
But could not begin (as she thought) to  
in life

So went to her mother with pencil and plate  
Containing Dear Sister and also a late

With nothing to say my kar girl do not  
think

Of wasting your time over paper and ink  
But certainly this is an excellent way  
To try with your slat - to find something, to say

I will give you a rule, said her mother  
my dear

Just think for a moment your sister is here  
and what would you tell her? Consider and  
then  
Though silent your tongue you can speak  
with your pen."

**GOD SENDS LOVE TO YOU**

[illegible]

Above them, of dark appearance, lay  
The wan  
A sickly mountain, steep & clear the way  
Hereticism  
The vapour with a y  
Like brooding armies, black and low  
Like huge, dark, heart from very tall  
In fold of snow and all in  
The unbroken, the red line

[illegible]

# THE CHILD'S BOOK OF POETRY

## THE TORCH OF LIFE

The proper title of this stirring poem in praise of the manly game of cricket is "Virtu Lampada," which means in English "The Torch of Life." The idea of the poem is that, if we keep shining in our life the spirit of honour we identify with "playing the game," we shall be making the best use of our power. The poem is from the pen of Mr. Henry Newbolt, by whose permission it is here reprinted.

THERE'S a breathless hush in the Close to-night—

Ten to make and the match to win—  
A bumping pitch, and a blinding light,  
An hour to play, and the last man in  
And it's not for the sake of a ribboned coat,  
Or the selfish hope of a season's fame,  
But his Captain's hand on his shoulder  
Smote—

"Play up! Play up! and play the game!"  
The sand of the desert is sodden red—  
Red with the wreck of a square that broke—  
The Gatling's jammed, and the Colonel dead,  
And the regiment blind with dust and smoke

The river of death has brimmed his banks,  
And England's fair, and honour a name,  
But the voice of a schoolboy rallies the ranks  
"Play up! play up! and play the game!"

This is the word that year by year,  
While in her place the school is set,  
Every one of her sons must hear,  
And none that hears it dare forget  
This they all with a joyful mind  
Bear through life like a torch of flame,  
And falling, fling to the host behind—  
"Play up! play up! and play the game!"

## THE KITTEN AND THE FALLING LEAVES

No poet has yielded more pieces for our BOOK OF POETRY than William Wordsworth, who is the author of the following poem. Although the subject is commonplace, the poet treats it with a delicate art and true observation, which make his lines memorable. Poems like this serve a very high purpose in leading us to exercise our own powers of observation, and to realise that these commonplace things of daily life may be interesting if we but look at them right.

SLE the kitten on the wall,  
Spotting with the leaves that fall,  
Withered leaves—one—two—and three—  
From the lofty elder-tree!  
Through the calm and frosty air  
Of this morning bright and fair,  
Eddying round and round they sink  
Softly, slowly one might think,  
From the motions that are made,  
Every little leaf conveyed  
Sylph or fairy luther tending,  
To this lower world descending,  
Each invisible and mute,  
In his wavering parachute  
—But the kitten, how she starts,  
Crouches, stretches, paws, and darts!  
First at one, and then its fellow,  
Just as light and just as yellow,  
There are many now—now one—  
Now they stop and there are none  
What intuseness of desire  
In her upward eye of fire!  
With a tiger-leap half-way  
Now she meets the coming prey,  
Lets it go as fast, and then  
Has it in her power again  
How she works with three or four,  
Like an Indian conjuror,

Quick as he in feats of art,  
Far beyond in joy of heart,  
Were her antics played in the eye  
Of a thousand standers-by,  
Clapping hands with shouts and stare,  
What would little lobby care  
For the plaudits of the crowd?  
Over happy to be proud,  
Over wealthy in the treasure  
Of her own exceeding pleasure!

## THE BURIAL OF THE LINNET

Mrs. Ewing, who lived from 1812 to 1885, was in her day an extremely popular writer for the young, and many of her stories are still in circulation. She also wrote poetry, of which the following is an example, but she is better remembered for her charming stories of quiet everyday life.

FOUND in the garden dead in his beauty—  
Oh that a linnnet should die in the spring!  
Bury him, comrades, in pitiful duty,  
Muffle the dinner-bell, solemnly ring  
Bury him kindly, up in the corner,  
Bird, beast, and goldfish are sepulchred there  
Bid the black kitten march as chief mourner,  
Waving her tail like a plume in the air  
Bury him nobly—next to the donkey,  
Fetch the old banner, and wave it about,  
Bury him deeply—think of the monkey,  
Shallow his grave, and the dogs get him out  
Bury him softly—white wool around him,  
Kiss his poor feathers—the first kiss and last;  
Tell his poor widow kind friends have found him  
Plant his poor grave with whatever grows fast  
Farewell, sweet singer! dead in thy beauty,  
Silent through summer, though other buds sing  
Bury him, comrades, in pitiful duty,  
Muffle the dinner-bell, mournfully ring

## TRY AGAIN

These familiar lines by William Edward Hickson have been as often quoted as some of the finest poetry in our language, although, of course, they are only rhymes for children. It is the idea here, rather than the form in which it is expressed, that makes the words worthy of quotation. Hickson wrote on educational matters, and lived from 1803 to 1870.

THIS is a lesson you should heed,  
Try again;  
If at first you don't succeed,  
Try again,  
Then your courage should appear,  
For if you will persevere,  
You will conquer, never fear,  
Try again  
Once or twice, though you should fail,  
Try again,  
If you would at last prevail,  
Try again,  
If we strive, 'tis no disgrace  
Though we do not win the race,  
What should we do in that case?  
Try again  
If you find your task is hard,  
Try again;  
Time will bring you your reward,  
Try again,  
All that other folk can do,  
Why, with patience, may not you?  
Only keep this rule in view,  
Try again

## LITTLE VERSES FOR VERY LITTLE PEOPLE

ONE two three four five  
Once I caught a fish alive  
Six seven eight nine ten  
But I let him go again



Why did you let him go?  
Because he bit my finger so  
Which finger did he bite?  
The little one upon the right

POOR Dicky's dead! The bell we toll  
And lay him in the deep dark hole  
The sun may shine, the clouds may rain  
But Dick will never pipe again!  
His quilt will be as sweet as ours  
Bright buttercups and cuckoo flowers

LITTLE maid pretty maid! whether  
ghost thou?  
Down in the forest to milk my cow  
"shall I go with thee?" No not  
now  
When I send for thee then come  
thou

OH my pretty cock! Oh my handsome  
cock!  
I pray you do not crow before day  
And your comb shall be made of the  
very beaten gold  
And your wings of the silver so gray

DANCE little lily dance up high  
Never mind lily mother is fly  
Craw and caper, caper and crawl  
There little lily there is no  
Up to the e sky, down to the ground  
Backwards and forwards round and  
round  
Dance little lily and on ther wading  
We a the merry col d d d d d d d

UNDER the window is my garden  
Where sweet sweet flowers grow  
And in the pear tree dwells a robin  
The nearest bird I know

Tho I peep out betimes in the  
morning  
Still the flowers are up the fir t  
Then I try and talk to the robin  
And perhaps he'd chat—if he dur t

YOU see merry I lullis that dear little  
maid  
Has invited Binda to tea  
Her nice little garden shaded by trees  
What pleasanter place could there  
be?

There's a cake full of plums there are  
strawberries too  
And the table is set on the green  
I'm fond of a carpet all daisies and grass  
Could a prettier picture be seen?

A blackbird (yes blackbirds delight in  
warm weather)  
Is sitting from yonder high perch  
He sees the two little ones talking  
together  
No wonder the blackbird is gay

RICH A DUB DUB  
Three men in a tub  
The butcher the baker  
The candlestick maker  
And they all jumped out of a rotten  
potato



DID DIDDY DID DIDDY DID  
The cat loves the cat  
Had a cat  
To fetch her  
Diddle did diddle did

# THE CHILD'S BOOK OF POETRY

My house is red—a little house,  
A happy child am I  
I laugh and play the livelong day,  
I hardly ever cry

I have a tree, a green green tree,  
To shade me from the sun,  
And under it I often sit  
When all my work is done

My little basket I will take  
And trip into the town  
When next I'm there I'll buy some cake,  
And spend my bright half-crown

I love little pussy.  
Her coat is so warm,  
And if I don't hurt her,  
She'll do me no harm

So I'll not pull her tail,  
Or drive her away,  
But pussy and I  
Very gently will play.

She will sit by my side,  
And I'll give her her food,  
And she'll like me because  
I am gentle and good.

## A CHILD'S EVENING PRAYER

Words by ARTHUR GRAY

Music by permission of MESSRS SCHOTT & CO

When I'm put to bed to-day, Both my  
eyes I'll shut and say "Fa-ther, till the morn-ing  
light, Watch my lit-tle bed to-night!

"All the people in all lands  
Take into Your loving hands,  
Old and young and great and small,  
From all danger guard them all!"

"Give the sick ones gentle sleep,  
Dry the eyes of those that weep,  
And, please, leave the moon to light  
All poor travellers through the night!"

THE NEXT 108 IS AND NURSERY RHYMES ARE ON PAGE 3555

## BIBLE STORIES The Life of Jesus



### THE TRIAL OF JESUS

THE morning had not yet broken when Jesus was brought bound before Caiaphas the high priest. He had been hurried across the courtyard with unseemly haste. He was thrown before His second judge. The gentle Teacher found Himself surrounded on all sides by Pharisees and Sadducees who whispered eagerly among themselves and with unconcealed excitement endeavoured to hasten the trial. It was of the first importance to their religious authorities to conclude the legal formalities as quickly as possible. The multitude who loved the Master were a leep.

Caiaphas was an altogether different man from his father-in-law Annas. He was adroit and cunning. Among the high priests of that period he was able to hold the difficult office for many years. He was a man who satisfied the Roman government. Jew though he was for the sake of power he veiled his antagonism to the hated foreigner and frowned upon the ban he wished to bite. He was something of a statesman. While satisfying the Romans he pleased his own people the Jews.

Before this curious ghastly stood Jesus, the carpenter, teacher from Nazareth, bound like a common thief and thronged by Pharisees and Sadducees and witnesses paid to bear false witness against Him.

The witnesses were called. It was a miserable scene of petty questions and blundering answers. No witness could be got to say what the priests needed for passing sentence of death. At last two men came forward who declared that Jesus had said He was able to destroy the holy temple of the Jewish religion and rebuild it in three days.

Caiaphas turned from the witnesses to Jesus and inquired if He denied this charge. Jesus preserved silence.

Answerest Thou nothing? demanded Caiaphas. What is it which these witnesses against Thee?

But still Jesus held His peace. Then the astute Caiaphas determined to get the condemnation of Jesus from His own lips. And so he said, looking earnestly at Jesus, by the living God that Thou tellest us whether Thou be the Christ, the Son of God.

This was the question of questions. Witnesses might say this and that, but Jesus might prefer to deny it against Him. But he was the supreme and correct question. Did Jesus Himself say that He was the King expected by the Jews?

If He said that then there would be little difficulty with the Romans in having Him to die. The court held its breath waiting anxiously for the answer which Jesus would give.

answer was His doom  
m," He said then, while the  
ed court gasped with horror  
d "And ye shall see the Son of  
ing on the right hand of power,  
ing in the clouds of heav'n"  
s the answer they had desired,  
withoutless horrible to them in then  
Some of them spit on Jesus,  
must then look rudely over  
so that He could speak no  
others strove that there were  
ones. "Prophecy! Prophecy!"  
s the prophets arose, reading  
ents to praise the Jews by his  
What need we any further  
he asked, pleased by

have heard the blasphemy,  
kave?" asked this obsequious

om was filled with shouts of  
Death!"

The trial was over. This committee of the Sanhedrin, sitting in the darkness of the night, decided that Jesus was guilty of death. That little body of miserable priests believed that in sentencing Jesus to death they were putting a final end to His teaching. None of them dreamed that He whom they condemned in the darkness of night would be known throughout history as the Light of the World.

#### THE SAD WORDS THAT JESUS HEARD AS HE CROSSED THE COURTYARD

Jesus was led away to the guard-room. As He once more crossed the courtyard, where the light of dawn was beginning to fall upon the stones and pillars, the sound of a familiar voice reached His ears. It was a voice very dear to Him. It was the voice of His friend and disciple, the large-hearted Simon Peter. This disciple had come secretly to see the end. He had mingled with the crowd of people and servants waiting in the courtyard, hoping to escape detection among this excited gathering. But one of the servants heard him speaking, and recognised his dialect as that of Galilee. This girl turned to him and asked if he was a follower of Jesus. Peter denied the charge, and added, "neither understand I what thou sayest." Another maid approached and said "This is one of them!" Again Peter denied. At last those sitting near him said "Surely thou art one

of them, for thou art a Galilean, and thy speech agreeth thereto."

Peter, with an oath, angrily denied the dangerous charge, saying "I know not this man of whom ye speak."

#### PETER GOES OUT TO WEEP BITTERLY AND JESUS IS LED BEFORE PILATE

It was these words which fell upon the ears of Jesus as He crossed the courtyard on His way to the guard-room. He turned, and looked towards Peter, sitting beside the brazier with his hands extended to the glowing charcoal. The people rose with excitement as Jesus appeared. The eyes of Master and disciple met across that eager crowd, and the heart of the disciple broke within his breast.

Jesus passed among the taunts of the people to the guard-room. Peter went out, and wept bitterly.

In the guard-room, while He waited for the dawn of Friday, Jesus was brutally treated by the servants of the priests. Worn and broken, He was dragged early in the morning before the full Sanhedrin, and after fresh insults and cruelty was led away to the Roman procurator.

Under the law of Rome, the Sanhedrin could not take life. That right belonged exclusively to the imperial power. Therefore, it was necessary for the priests to persuade the Procurator of Judæa, Pontius Pilate, to give effect to their sentence of death.

Pontius Pilate is a name execrated throughout Christendom. But let us see if we cannot form a just idea of his character, and understand his position. He was a proud and able Roman, sent away from the splendours and glories of life at Rome, to rule in a dull, dirty, and evil-smelling city of the East. He came among the Jews despising them, and with the determination to rule them with a rod of iron. He was that type of imperial officer who rules subject nations by fear.

#### WHY PONTIUS PILATE WAS HATED AND LOATHED BY THE JEWS

Like all educated patricians of Rome, he was a man of books, accustomed to refined conversation, and interested in the advance of science. As Procurator of Judæa he found himself among a quarrelsome and cowardly race, who were always fighting about trivial matters of their religious worship, and who—in the midst of their insanity



## THE TRIAL OF JESUS

and ignorant lives—actually dared to regard the Romans as an inferior race. At first Pilate endeavoured to cow this petty people. But he was met by a form of resistance utterly new to him. The Jews did not strike against him; they *passively* resisted his demands. He encountered the total resistance of an entire people, the whole nation simply refused to obey. To destroy an army is one thing; to destroy a nation is another. Pilate found himself powerless.

enormous sums of money accumulated by the priests in the temple were to be employed. But the priests and people opposed Pilate, and the reform had to be dropped.

He was hated and loathed by the Jews. They schemed against him with the cunning of their race and sent reports to Rome that this tyrannical governor was ruining the province and would surely lose it to the empire. Pilate appears to have had trouble with



JESUS HEARS THE VOICE OF PETER DENYING HIS MASTER AND PETER TURNS AWAY  
From the painting by Harrold, by permission of the Berlin Photographic Co.

Then it was that he discovered the tremendous seriousness with which these Jews regarded their religion. Rather than see that religion—which Pilate as a Roman, naturally despised—injured or degraded in the smallest degree, the Jews would withstand the empire would die to the last man.

Pilate endeavoured to do everything for the comfort and convenience of Jerusalem. The greatest need was pure water, and he set about the construction of an aqueduct. To pay for this the

emperor on account of these reports but the fact that he held his procuratorship for so long a period as ten years proves to us that on the whole he was upheld by the authorities at Rome.

To Pontius Pilate such as he sat in his Herodian palace on this Friday morning the news that there were priests calling for him with a matter in their hands, was only a venial and troublesome minor matter. The fact which most annoyed him was that he had to go out to these Jewish people

instead of summoning them to his presence. For the Jews would not enter the palace of any Gentile—as foreigners were called—because they said it polluted them. The proud Pilate had found early in his procuratorship, that it was necessary to bow to the Jews in this matter. They utterly refused to cross his threshold.

PONTIUS PILATE MOVES TO HIS PLACE IN UNIVERSAL HISTORY

So, on this Friday morning we must picture to ourselves the proud Roman governor rising impatiently from his ivory chair, and leaving the serious business of his rulership to settle some trivial quarrel of this hated race.

It did not occur to Pilate, as he rose with vexation and made his way through the prætorium to the outer court of his palace, that he was moving to a place in universal history, that he was going to write his name in everlasting characters upon the walls of Time.

The scene that met his eyes as he emerged from his palace presented nothing unusual. There in the courtyard, filling it with the evil odours of their duty clothes, was the rabble of Jerusalem, laughing, gesticulating, talking at the tops of their voices. There, too, was a gathering of priests, in their official vestments, fresh from some angry altercation in their absurd Sanhedrim. And there, too, was the unfortunate prisoner—for Pilate, just an ordinary prisoner—a man bound with ropes, a poor, harried, overdriven, and ragged man, whom they had kept awake all night with their pitiful quarrelling, and who now stood, pale and haggard, in their midst, waiting to hear what the Roman governor would say.

THE SCENE IN WHICH JESUS STOOD SAD AND WORN, THE LIGHT OF THE WORLD

That is the scene—the haughty Roman looking down on the noisy rabble and the whispering priests, the whispering priests glancing up threateningly at the Roman governor. And in the midst of it all, bound with ropes, worn and sorrowful, stands Jesus, the Light of the World.

Pilate heard what they had to say. Somebody had been setting Himself up as a King over the Jews. They made it a serious matter, this man Jesus was actually attempting to overthrow the dominion of Rome. He was a traitor

against Caesar. Amused that they should be so hot in favour of Caesar, and amazed that they should take seriously any attempt to overthrow the power of Rome, the procurator searched among the crowd for the prisoner.

There in the centre of the seething mass, pale of face, spent and weary with want of sleep, bowed and broken by the savage treatment. He had suffered at the Jews' hands, stood a young man bound with cords, and held by Levites of the temple guard—Jesus of Nazareth.

Pilate looked upon Him.

"Art Thou the King of the Jews?" he asked.

The question was meant to dispel the charge. But, as the hush of silence which had fallen over the crowd when Pilate spoke deepened to catch the prisoner's answer, Jesus replied "Thou sayest it."

It was the answer the priests wanted, but Pilate was convinced that this was no seditious rebel against the Roman power, and he again sought to dismiss the charge.

"I find no fault in this man," he said.

THE TERRIBLE CRY OF THE CROWD AROUND PILATE'S PALACE

Then, in a torrent of words, the priests shouted more and more charges against Jesus, and as Pilate listened to them he looked at the bound prisoner and waited for Him to speak.

But Jesus, called upon to defend Himself, said nothing.

Perhaps for the first time in his life Pilate looked upon a Jew silent under accusation.

"Answerest Thou nothing?" he demanded. "Behold how many things they witness against Thee."

But Jesus held His peace.

Pilate was struck by the self-reverence of this lonely, silent figure in the midst of that clamorous multitude. To punish such a rare Jew seemed to him a cruel, unnecessary act. He made light of the charge, and suggested to the people that as, according to his custom, he was willing to release one prisoner at their Feast of the Passover, he should release this "King of the Jews."

But, at this, a snarling cry of rage broke from the crowd. "Not this man! Not this man! But Barabbas!" The fury of the people was extraordinary. Pilate marvelled that they should

## JESUS BEFORE PONTIUS PILATE



After His mock trial before the high priest Jesus was led away to the palace of Pontius Pilate the Roman governor. He or before had Pilate be a called upon to try a prisoner. There stood Jesus surrounded by a howling mob bound and harried yet calm and heroic and while the priests with hatred on their faces accused Him, and the crowd cried out for His blood the pilot uttered not a word with that Pilate is revealed.



They know that they had accused Jesus, not for a great wrongdoing, but because they were afraid of Him and jealousy. And he thought the crowd would side with the prisoner. There might be an answer out of the gallery that faced him on, appearing to that suffering man before his palace to shed if he should choose even. Instigated by the priests, the people shouted, Crucify Him! and Pilate delivered Jesus to death.

The way Jesus is surrounded by persecution of Him. Christ's suffering from the world. How many in America have known pain.

he so eager to punish this young Nazarene. They preferred that Barabbas should be released, a noisy and dangerous rebel who had committed murder. "What will ye, then," he asked, surprised at their choice, "that I shall do unto Him whom ye call the King of the Jews?"

"Crucify Him!" was the terrible answer.

It rang through the courtyard like the howl of wolves. It staggered the Roman procurator as he stood looking down on the people. Crucifixion—the extreme penalty, the agonising and most shameful death known to a Jew! Crucifixion for a young man who had called Himself King of the Jews!

"Why?" he expostulated. "What evil hath He done?"

Fiercer than ever came back the furious answer.

"Crucify Him! Crucify Him!"

It was in vain that Pilate endeavoured to understand these Jews over whom he ruled with contempt and disgust.

If they had cried "Scourge Him!" he might have understood; if they had cried "Imprison Him!" he might have sympathised. But "Crucify Him!" crucify this harmless and quiet young man—that was a barbarous act.

**PONTIUS PILATE YIELDS TO THE MOB AND CHANGES THE HISTORY OF THE WORLD**

And yet to him, the Roman, what were these petty disputes of the priests, and what was the life of a single Jew? The death of this silent young Jew would make no difference to the world. The loss of the world to Him would not count for much. There would be one Jew the fewer for Pilate to rule over, and one man more whose eyes had closed upon the skies and the green earth for ever. That was all. Why should he pity Jesus? Why should he stand any longer in this wretched crowd? Perhaps it was with a contemptuous shrug of his shoulders that he accepted the verdict of this mob. He gave the order for Jesus to be scourged.

That decision of Pontius Pilate—a decision to which it appears he attached not the smallest importance—was destined to alter the history of the world. It is, indeed, impossible for us to imagine what civilisation and the map of Europe would now be if Pontius Pilate had refused to put Jesus to death.

We are filled with wonder, looking back now through the distant corridor of Time, to see the figure of the Roman procurator moving impatiently away from the Jews, turning his back upon Jesus, and going with relief to the purer air and the cultured delights of his beautiful palace.

**THE SCENE IN THE COURTYARD WHEN PILATE SET BARABBAS FREE**

That figure of Pontius Pilate, moving away from the Light of the World, remains for humanity one of the most striking in all history. The victories of Napoleon Bonaparte are as a grain of sand in comparison with the act of Pontius Pilate in turning his back upon Jesus. Imagine the scene. From the crowded courtyard arose a shout of delight and derision, delight that Jesus would die, derision that Rome had been compelled to do the will of the Jews. And while Pilate marched back to his palace, a new shout of triumph arose, for Barabbas, malefactor and murderer, was free again, and was being deliriously embraced by his friends.

In the midst of this hideous and degraded scene, picture the figure of Jesus. Can we not imagine how that lonely, and tired, and silent man was taunted and brutally treated by the rejoicing mob? Can we not imagine how they struck at Him, how they shouted in His face, how they spat upon Him? Can we not imagine the terrible pressure about Him—the swaying of the mob as they struggled to get near Him, that they might strike, and spit, and insult?

**FAR FROM THE GREEN HILL, FAR FROM THE LITTLE FLOCK**

And this was the Jesus who had taught that the Creator of the world is a Father, that all humanity is a brotherhood, and that to enter into the kingdom of heaven a man must become as a little child. Far away now is the green hill where He uttered the beatitudes; far scattered is the little flock of disciples who looked to Him as their Shepherd, far distant is the home in Bethany where He had loved to rest.

He is alone with the Jews. The scourge is being prepared. The Cross is drawing near. Last night the Garden of Gethsemane; this morning the hall of justice. Pontius Pilate, the Roman governor, has turned his back upon Jesus.

The next Bible Stories are on page 3533.



## WHERE DOES THE RAIN GO?

Many things happen to the rain that sinks in the earth and exactly what happens depends largely on what the surface of the earth is like at that particular place. A great deal of the rain remains in the soil to the depth of some feet as soil water or ground water. If there is no such water there can be no vegetable life. But in places where rain falls and the ground holds some of it there we are sure to find plants of various kinds that suck up a good deal of this water into themselves by their roots and then give it back to the air. The soil also contains all sorts of life of other kinds besides green plants, such as various kinds of animals like worms and insects and also countless numbers of microbes. All these take up and use for their lives some of the water that the rain gives to the soil.

But still a great deal of the rain is not used up in any of these ways. Much of it is sucked up again into the air by the sun's heat when the rain stops falling. Much of it also goes on sinking slowly through the earth until it reaches a layer of something that it cannot sink through. It may be carried on this layer to some low level where it is available up out of the ground to what we call a spring.



In the long run almost all the rain that is not kept by living things or given back to the air at once gets into streams and rivers and into the sea where the sun sucks it up to go on its round again.

WHERE DID ALL THE WATER IN THE OCEANS COME FROM?

We might at first think if we remember how all the rivers run into the oceans that rivers bring the water. But after all just as much water as the rivers bring is caught up by the sun into the air and the amount of water in the sea is in any case too great for the rivers to account for. By far the greater part of the water in the oceans is what we may call the original water of the world which has gathered in the ocean beds because they are the most convenient places for it to be in under the influence of the earth's gravitation. The water as we know it was long ago held in the air when the air was much hotter than it is now. But if you see it is right for us to ask where it came from or before it fell upon the earth and before it formed the oceans. The air was so hot that it was made of gases by the last gas of hydrogen with oxygen. I know it is a little hard to understand what came out of the water of the world was formed it was

very hot, and hydrogen existed separately, though there was plenty of oxygen near it. As the earth cooled a little, however, it became possible for hydrogen and oxygen to combine, which they did, forming water. There is vastly more oxygen than hydrogen in the world, as we know, and most of the oxygen which was left over when the hydrogen was burnt up to form water is to be found in the atmosphere still.

HOW IS IT THAT THE WATER OF THE SEA DOES NOT SINK INTO THE GROUND?

Wherever it can, water does sink into the ground, and where the sea is deep, the pressure of all the water above will force the water at the bottom into the ground if it can possibly go there. It is probable that in most places the ground of the sea is of a very dense kind which water cannot penetrate as a rule, but often things may happen to it that will allow some water to pass through, and then, when that water reaches the hot levels of the earth's crust, it is turned into steam, and may make a great disturbance. We always think of earthquakes as things that happen on the dry land, but we know that earthquakes also occur in the bed of the sea. When a very powerful earthquake occurs in the bed of the sea, and a great deal of water sinks in and is turned into steam, we get what may be called a seaquake, and there is little doubt that some of the strange and terrible things which the sea does are caused in this way.

But we must suppose that, on the whole, the bed of the sea is not so easily penetrated by water as many parts of the dry land are, and that is perhaps one reason why it has become the bed of the sea. Instead of letting the water run through it, it holds the water upon the top of it, as the bottom of a basin does, and then the weight of the water gradually helps to force it down and make it cup-shaped, so that it will hold still more water. But we cannot be at all sure about this, for it is a very difficult thing indeed to find out.

WHAT IS IT LIKE AT THE BOTTOM OF THE SEA?

No man has ever been to the greatest depths of the sea, for even if it were possible to send air down to him, the pressure of water above his head would be far too great for him to stand. But

we can get some idea of what it must be at the bottom of the deepest parts of the sea, for we know the kind of things that live there, and we know something of the conditions of their lives. Three, five, or eight miles below the level of the sea there cannot be very much light, and though it cannot be perfectly dark, yet it is what any of us would call quite dark. Here there lives a strange medley of creatures—strange fishes and sea-weeds. Down to them, from above, there descend the remains of all sorts of other sea creatures that live in the heights of water above them.

If we remember that the sea covers something like five-sevenths of the whole earth, we shall see that, of the total amount of life upon the earth, a very large proportion is to be found at the bottom of the sea. It is life of a very humble kind for at least two reasons. One is the immense pressure of the water above it, which prevents the development of more noble forms of life; the other reason, that has the same result, is the very small quantity of oxygen that is available for the purpose of life at the bottom of the sea. This means, of course, that the life of these creatures must be lived very slowly, and is indeed very different from the life of creatures that have air to breathe, or even a fish that lives in a stream which has plenty of oxygen dissolved in the water all around it.

WHY DOES A BOTTLE FULL OF HOT WATER KEEP HOT LONGER THAN ONE HALF FULL?

The answer to this is that the bottle full of hot water contains more heat than the bottle which is only half full. Water is a wonderful storehouse of heat. Different things require different amounts of heat to be put in them in order to be raised to the same temperature or hotness. We might think this should not be so, but it is. If you take a certain quantity of water at any fixed temperature you please, and then the same quantity of anything else in the world, and then make them both, say, five degrees hotter than they were before, you will find that you have to put more heat into the water than into the other thing, and just as it takes longer to heat water than to heat anything else, because you have to put more heat into it, so water takes longer to cool than anything else, because it has more

heat in it to lose and of course the greater the quantity of water the more heat it has within it.

But there is another point to remember the bigger the mass of anything is the longer it takes to cool. A thing cools from its surface inwards the parts inside it keep each other warm. The smaller the mass of a thing the bigger is the proportion of its surface to the amount of stuff in it and so the quicker it cools. So that the case of the hot water bottles the different rates at which the sun the earth and the moon get cool and the fact that a baby requires to be more warmly clothed than a man are all explained by the same law.

WHERE DOES THE OXYGEN IN THE SUN COME FROM IF THERE ARE NO PLANTS?

It is rather difficult for us to understand but we must remember that a thing may be intensely hot and glowing and flaming without any burning combustion or combining with oxygen going on. The thread inside an ordinary electric lamp is an instance of this. Now long ago astronomers thought that the sun's heat and flames were due to burning going on in the sun just as it goes on in a fire on the earth but then they came to ask themselves practically just the question we are asking. If the sun's heat and light are due to combustion where does all the oxygen come from and where does all the fuel come from? If the sun were burning as a fire is burning it would have burnt itself out millions of years ago. There is nothing like enough material in the sun to account for all the light and heat it produces. Therefore burning combustion or combining with oxygen has nothing to do at all with producing the sun's heat and light any more than with producing the heat and light of an electric lamp. The sun's supply of heat is kept up in other ways partly by its ceaseless shrinking and partly we suppose by the breaking up of the atoms of elements such as radium in the sun.

IF THE EARTH'S CENTER IS A BALL OF FIRE WHY DOES IT NOT BURN UP EVERYTHING?

When we say burning or combustion we mean combine with oxygen. So if there is no oxygen in a place burning cannot go on. The things there may glow and be intensely hot but they cannot burn—which is to explain

with oxygen—for there is no oxygen at all for the things to combine with. That is one answer to our question but here is another. Very nearly the whole of the outside of the solid earth is already as burnt as it can be and so is all the water of the oceans. However hot we make them and however much oxygen we have we cannot burn water or sand or flint or clay or gravel for these things are already burnt. When the elements of which they are made have combined with all the oxygen that they are capable of combining with then they are as burnt as they possibly can be. Thus the whole exterior of the earth with only very scattered and slight exceptions has already been burnt up and what we call the earth and the sea are the results of that burning. This burnt crust now encloses the fire in the centre of the earth and keeps out the oxygen of the air—the oxygen which has been left over so to speak from what has been used up in burning the crust of the earth.

WHY COULD NOT THE EARTH'S SHAPE BE ALWAYS UNDERSTOOD FROM AN ECLIPSE?

Of course an eclipse of the sun by the moon would tell us nothing about the shape of the earth. So to make our question quite correct we should say not an eclipse but an eclipse of the moon. Since this as we know is due to the earth's shadow creeping across the face of the moon because the earth is cutting off the sunlight by which the moon is lit we are right and very thoughtful in supposing that the shape of the shadow ought to tell us the shape of the earth just as our shadow tells our shape. And we said that the shadow is a conical one—that is to say it curves outward like the side of a ball. In other words it is a shadow of a globe or sphere and since we know that the earth throws the shadow that tells us the shape of the earth.

But this most important argument though it is interesting is a weak one. It could not be used in the days when men were disputing about the shape of the earth. It can only be used when we know what an eclipse of the moon really is and we can only know what an eclipse of the moon really is when we have in our heads a picture of the solar system as it really is with the earth moving round the sun and having there on its globe

it as it goes. Though this all seems so plain and simple to us now, we must remember that we did not find it out, and that it took great labour and a very long time to find out. That is why those who argued long ago that the earth is round could not point to the shape of the shadow in an eclipse of the moon, and say that that proved their case. No one knew that that had anything at all to do with the matter.

**WHAT WAS THERE IN PLACE OF THE EARTH BEFORE THE EARTH WAS FORMED?**

Astronomers are not quite certain as to the details of the matter that existed in space before the earth was formed, and that gradually turned into the earth. This matter, indeed, probably passed through various stages rather different from each other. The simplest view, and one which is almost certainly true in the main, is that the last stage passed through before the earth was formed was that of a mighty cloud of glowing gas. It must have been very hot, for we have proof of that in the rocks, and in other ways, and as it was hot, it must have occupied a great deal of space. The earth upon which we live now is very small compared with that globe of gas, but, on the other hand, it is very much denser—for the earth has been steadily shrinking for countless ages, and we know that it is shrinking still. We may ask how it was that this great globe of gas came into being. We know that it did so by separating itself from the great mass of which the remaining central part is our sun. The other planets were formed in the same way, and so we find the same matter in the earth, and in the other planets, as we find in the sun. This globe was a little sun, indeed, as the great hot planet Jupiter is still, it was so hot that it must have given out light of its own.

**WHAT HAPPENS TO THE LIGHT WHEN IT GOES OUT?**

We have to think of light as a kind of energy, a kind of disturbance full of power that is made in the ether. It is a thing that travels at a tremendous speed, and it is not capable of being still. When we have a steady light in a room, it is not that there is something in the room called light which is staying there, but that from every millionth part of a second to every next millionth part of a second new

light is being steadily made. So we cannot keep light in a room as we keep anything material. If, for instance, we take a heap of sand into a room and then, putting it in a heap on the floor, do no more, it stays there until something removes it, but light stays nowhere, it is always moving; and if there is to be steady light in any place, there must be a steady source of light to produce it from moment to moment, or it will cease.

When we darken a room we cut off the source of light, and the light which was made an instant before is gone. Now we see why. But this question is a most important one, and people often forget to ask it. Nothing is lost, and the energy or power that made the light is not lost, even though the room is quite dark. If we could trace it we should find that it had been transformed into other things, it is transformed into heat, which we find in all the matter which it strikes—and this includes not only the furniture and walls, but also the air of the room, it is also changed into the power which starts chemical changes, as, for instance, when carpets and curtains gradually fade under its influence.

**DOES A FALLING STONE DROP QUICKER AS IT NEARS THE GROUND?**

The answer is "Yes." If falling things did not fall quicker as they fell, it would hurt us no more to fall five hundred feet off Beachy Head, or to fall thousands of feet from a balloon, than to fall to the ground when playing a game. The farther a thing falls, the more quickly is it moving when it reaches the ground, and the greater is the force with which it strikes the ground. If there were nothing to resist the fall of objects, there would be nothing to prevent this increase in speed getting greater and greater, but there is always the resistance of the air, and in the case of the fall of raindrops, that is sufficient to hold them back. If it were not for this, a raindrop falling on our head might fall with such terrible force as to kill us. The proper name for the increasing speed of a falling body is *acceleration*, and we shall remember not to spell it with two "l's" if we know that it comes from the Latin *celer*, *swift*. The acceleration due to the pull of the earth, which we call gravity, is the same for all falling bodies. It is



not greater for a heavier thing than for a lighter. Galileo showed this when he dropped two balls—one light and one heavy—from the leaning tower of Pisa and they reached the earth at the same moment. The amount of this acceleration has been precisely measured. It is 32 feet in every second of time—that is to say the falling body in each second falls 32 feet more than it did in the second before.

#### HOW FAR DOES A STONE FALL IN THE FIRST SECOND?

We know exactly the answer to this question. We might think at first if we read the answer to the last question that the stone must fall 32 feet. But 32 feet is the amount of increase in the rate of its falling at the end of a second and at the beginning of the second the stone was not moving at all. Therefore its average rate of movement throughout the second is midway between no movement at all and 32 feet—in other words an average of 16 feet per second. That is what we find at the end of a second the stone has fallen 16 feet.

#### WHY DOES A PLANT DO BETTER IN A POT THAT HAS A HOLE IN THE BOTTOM?

A plant like every other living thing must have water. A plant does not take its water by its leaves or stems but only by its roots. When we water a plant from above the water has to sink into the earth until it reaches the roots—and we may forget to water it. But if the pot has a hole in the bottom and stands in a saucer filled with water the water soaks through the hole just to where it is wanted—the part where the roots are. So it is carried up through the plant and at last given off by the leaves. Plants must have water running through them and so must we. In them it mostly runs upwards and in us it mostly runs downwards. It is probable also that a plant would do a little better in a pot with a hole in the bottom than in one without a hole even if it were not fed with water in this way for at least the hole would provide for ventilation and the plant needs a constant supply of fresh air as much as we do (from gills in the case). It gets that but in a pot made of something through which air can pass only very slowly the plant's ventilation is rather interfered with.

#### WHY DO WE NOT GET ALL WE WANT?

Some people do get all they want at least for most of their lives though the time comes for almost everybody when he wants to get well and cannot. Now if we study what happens to these people who get everything they want even without having to work for it we find that it is very bad for them. It is quite certain that we and every part of our bodies and every power we have are naturally meant to work to fight against difficulties and it is better to fight even if we do not conquer than it is not to fight at all. One of the reasons why history records so many wicked and degraded kings is that these were people who all their lives got everything they wanted. Every living creature that gets everything it wants given to it without striving is apt to become weak and degraded.

Many sensible grown up people who have lived careful lives and have had a fair chance in the world know that they do get all they really want. No doubt they would like to have more money than they have or if they are a higher kind of people more wisdom than they have. Yet they know that if they work they will get enough for their happiness and if wise people have that, they do not worry themselves by wishing for more. Children do not know what they can get and what they cannot get. So all children more or less cry for the moon as we do not knowing how far away the moon is. As they grow up they learn that it is not worth while to worry about things they cannot have but that it is much better to work hard for the things they can have.

#### WHAT IS IT MAKES US FEEL HUNGRY?

Most people confuse a few very different kinds of things together and call them all hunger but that is a very bad and a very wrong mistake. When a man has had a good dinner and has perhaps eaten more than he should, and then eats a chocolate or drinks a glass of liquor or takes a crystal ball or fruit he is doing something which may or may not be quite harmful. He is taking something that he does not want. We eat and drink a great many things at a time and before we realize it because we are ignorant of our weaknesses and are not wise.

like to be pleased, just as our other senses do, but we no more satisfy hunger by taking a pleasant sweet because it has a nice taste and smell than we do by listening to singing.

Real hunger is quite a different thing, and the place where it really is caused is not either in the mouth or in the nose. A person who is really hungry will eat dry bread, or tasteless oatmeal porridge, without milk, cream, or sugar, and he will find it delicious. Real hunger is a state of the blood. The blood has used up much of its food material, and needs more. As it passes through the brain, the brain—which is where we feel everything—finds that the blood has not sufficient food materials in it, and it sets the body asking for more. That is true hunger, and if we ate only to live, we should eat only when we had this true hunger. If we eat too much, or without being hungry, we eat to die in the long run.

#### WHAT MAKES THE PUPIL OF OUR EYES GROW LARGER AND SMALLER?

If we think of a very small, but thick, india-rubber ring, we shall understand the answer to this question. The pupil is simply the hole inside this ring. The ring itself in our eyes is not made of india-rubber, but it is elastic. It is made of muscular fibres that run round the pupil, and enclose it. The name of this ring is the iris. In front of the iris and behind it there are layers of cells which contain colouring matter, and it is these that give our eyes their colour. When we look at anyone's eye we can see this coloured muscular ring and the black hole in the middle of it. When the little muscular fibres contract, the pupils grow very small. We can see this happen in anyone if we cover his eyes, and then suddenly throw a strong light upon them. We may see this, too, in a person who has taken too much opium, for opium makes the iris contract very strongly, and so a person under its influence has "pin-point" pupils. In the darkness the iris relaxes and stretches, and then the pupil gets very large. Foolish people sometimes drop belladonna into their eyes, since this drug poisons and paralyzes the iris, and the pupils get very large and the eyes look brilliant. But the eyes suffer, for they cannot now protect themselves from a bright light by

shutting off part of it. The use of this beautiful arrangement is to regulate the amount of light falling into the eye. If we go into a darkish room straight from the sunlight, we can see nothing. In a few moments things become visible. The reason is that our iris has relaxed, the pupils have become larger, and more light is entering the eye.

#### WHAT IS THE LOOFAH THAT WE USE IN THE BATH?

The loofah looks like a stiff, fibrous piece of netting, and because it is tough, not brittle, it makes a capital thing to use for a good brisk rub when we are bathing. But it is not made by hands. It is the fruit of a plant, and belongs to the same family as the cucumber. The cucumber is not fibrous, or we could not eat it, and the loofah, or luffa, differs from it in this respect. Of course, the loofah is not, in its natural state, like the loofah of the bath-room. The loofah that we use is simply the fibrous skeleton of the cucumber, or gourd, that grew in Egypt. After the fruit has ripened it is dried, and the fleshy part disappears, leaving only the fibres, and these are so strong, and stand the action of water so well, that a loofah lasts quite a long time. There are about ten species of loofah, and one sort, grown in the West Indies, is used as a sponge or dishcloth.

#### WHAT MAKES SHADOWS AND REFLECTIONS?

Both shadows and reflections depend, of course, upon light, but they are very different things. Everything we see, except the light of a candle, or the sun itself, or some other luminous body that gives out light of its own, is a reflection—that is to say, what we see is the light reflected from the surface of the thing. Now, a shadow may sometimes look like a reflection, and people sometimes mix up the two words, but there is a great difference. In the picture on page 3435, of some boys on a wherry, what we see is the reflection of them in the water. If the sun were behind the boys, then their bodies would interfere with the rays of light as they approached the water, and the water would show shadows which might be of just the same shape, or almost the same shape, as these reflections are. There is nothing difficult to understand about a shadow. Of course, the

whole of these shadows would be quite dark unless there was some part of the boys that was transparent and let the light through. What we see in the picture are not shadows because for instance the white tie of the fourth boy from the left is shown white in the water.

What has happened here is that the light striking the front of the boys and coming off from them in straight lines in all directions has been reflected from the surface of the water which must have been perfectly still like the surface of a mirror. There can have been no wind when this photograph was taken. In such a case water may

be mistaken when we think that sleeping creatures only wake up when something arouses them from outside. It is possible to study the exact amounts of noise that will wake people at different parts of the night and we know that a morning approaches healthy people or animals sleep less and less deeply so that things wake them which would not have wakened them in the earlier part of the night. Healthy creatures probably either wake up quite apart from anything outside them and because their brains have now rested long enough and are ready to start work again or else their brains are just ready to wake up with the least thing,



The sun is shining upon the front of these boys and so we see their reflection in the water. The white tie of one of the boys proves it. If the sun were behind them it would be their shadow that we should see in the water.

be a very nearly perfect mirror. Yet it is not perfect for some of the light passes through the water and is there absorbed instead of being thrown back or reflected to our eyes. So at all points the reflection is less bright than the images of the boys themselves. If the water had thrown back perfectly all the light sent to it there would not be this difference. Let us compare for instance the whiteness of the boys' ties and the reflection of it in the water.

**WHAT WAKES UP THE BIRDS?**  
Sleep is a very mysterious thing that we do not know much about yet but at any rate we are certainly

and some little noise or light—it does not need much then—gives the necessary signal.

So we may say and it is perfectly true that it is the light which wakes the birds just as it is the dark that sends them to sleep. We know that during a total eclipse of the sun when it gets dark in the daytime the birds fold their wings and wait to go to sleep. Of course they very soon find out that they were wrong. But with the light of dawn or perhaps the voices of other birds that are awake and a little sooner seem to be waking up the first, yet we must admit that

waking and sleeping, in all living creatures that wake and sleep, really depend, not on what is happening outside but on changes that go on inside, to and from inside the creature in question, especially in its blood and brain.

#### ARE THERE ANY PEOPLE IN THE OTHER WORLDS?

This is a great question, to which no one can return a certain answer, and about which many big books have already been written and many more will be written. But something we can be sure of. People sometimes talk as if there could be men on other worlds, but we may be sure when we think of the wonderful way in which men are adapted to this earth of ours, to its air, and water, and climates, and food supply, that there could be men like ourselves only on a world *just like ours*, and we certainly do not know of the existence of any such world. Those we know all differ greatly from our earth in all sorts of most important things such as the composition of the air. *Man*, then, is a child of earth—this particular earth of ours. he is exquisitely fitted for it, and it for him, not only in its air, and soil, and oceans, and heat, but also in the kind, and the balance, as we may say, of the thousands of animals and plants that inhabit it with him. We are certain that men and women and children like ourselves could be found only here, or on some other world, unknown to us, which is an exact double of our earth. Such a world is quite unlikely to exist anywhere.

#### IS IT POSSIBLE THERE MAY BE LIVING CREATURES ON OTHER WORLDS?

This question is a very different one indeed from the last, and we need have no doubt at all that the answer is "Yes." To begin with, it would surely be very extraordinary, would it not, if *life*, which is the highest thing we know, and with which earth, and air, and sea are crammed, were confined, in this mighty universe, only to our little earth, if all the other worlds, big and little, far and near, were *dead*, and only rocks or glowing fires?

Then, again, we know that other worlds are made of similar materials to those that make our own earth, and we are sure that the laws of matter and chemistry apply everywhere, so that if life could be developed on our earth, it

might be developed on many worlds. Further, we know that life has an endless power of fitting itself to outside conditions. Life flourishes on our own earth in extreme cold and great heat on almost dry rock, and in the depths of the sea. So he would be a rash man who declared that life could not find, on other worlds, conditions fit for it to develop in. More than this, we have some hints—and more than hints—of real evidence that life exists on some other worlds, such as the moon and Mars.

#### ARE THERE MEN ON MARS?

The answer to this must certainly be "No," as astronomers have shown us that Mars is very different from the earth in many ways. It is smaller, so that the power of gravitation is less; it has very little water, its heat is probably very different—perhaps much hotter than the earth by day, and much colder at night; and it has not much of an atmosphere. For these, and a host of other reasons, any living beings on Mars must be vastly different from men in a number of ways. But, on the other hand, we can see on the surface of Mars markings which must almost certainly be due to strips of vegetable life, and it has just been proved that water exists on Mars, though this used to be denied. Also, we know Mars has an atmosphere, though one very different from ours.

#### CAN THERE BE ANY KIND OF INTELLIGENT LIFE ON MARS?

It is almost certain that there is life of some kind on Mars, and some people believe there are thinking beings on Mars—not men, yet beings who might understand men, and whom men might understand when they got to know each other's way of expressing themselves.

Some people who have given their whole lives to the study of Mars are quite certain that there are marks upon its surface which only intelligent beings could have made, and are even sure that all the "Martians" must be one great family who live in a friendly way, and have given up fighting each other as men still do, for the marks on Mars, it is thought, could only have been made by a race of beings who had given up wars, and frontiers, and quarrelling, and worked all together for the good of all. Perhaps the children who read this answer may live long enough to learn for certain what is the truth about the

canals of Mars and how they came to be made. There is scarcely a more interesting question in the world.

**WHAT IS THE USE OF THE PLANETS THAT HAVE NO LIFE ON THEM?**

No doubt some of the planets have no life upon them and no doubt life is the highest thing that can happen on a planet. But we have every reason to suppose that life will develop at some later date upon the planets such as Jupiter which are now too hot to bear it just as our earth once was. So we might say that these planets are preparing for the use of bearing life. There may be other planets which are now too cold but once had life upon them and there may be planets which never had and never will have life upon them. We human beings may perhaps be able to make use of them by watching their movements in the sky and that is all. But though they are of no use or little use to us perhaps they have a use and a meaning for their Maker.

**WHAT IS THE USE OF STARS THAT ARE TOO FAR AWAY FOR US TO SEE?**

People have tried the hopeless task of proving that even the stars which are too far away for us to see have some use for mankind—that perhaps they send us some kind of radiation which is useful for our eyes. There is no proof of this and nothing is less likely. Probably the use of the stars which are too far away for us to see and the use of the stars which are not too far away for us to see are the same as the use of the star which we can see best and which we call the sun—to support and nourish life in their neighbourhood. And if there are stars which have no such use and which certainly might not exist for all the difference they make to us yet there are more uses and purposes in the universe than we can guess or dream of.

**WHY DO WE WANT TO WALK SLOWER UP HILL THAN DOWN?**

When we walk on the level we have only to work against such things as the resistance of the air and the weight of our legs as we lift them up and down. When we walk downhill less effort is required on our part in some ways because in walking downhill we are to a certain extent falling—that is to say we are falling and nearer the centre of the earth. Yet in some cases of time especially if a hill is very steep it may be very tiring to walk down

it because we have to balance ourselves so carefully. This is owing to the strain on our toes pressing against the inside of our boots and the half-conscious fear in our brain that we may be pulled down too quickly and hurt ourselves. When we walk uphill the work is very hard because then we have by sheer muscular effort to lift our whole bodies away from the centre of the earth in defiance of gravitation. We have to exert in the opposite direction a greater force than that of gravitation.

**DO WE USE UP MORE ENERGY IN WALKING UPHILL THAN ON THE LEVEL?**

The difference can be measured in such cases and it is said that to walk up a steep hill at a given pace costs us more than twenty times as much effort as to walk at the same pace along the level. No wonder then that we want to walk slower uphill! The reason is really exactly the same as the reason why we lift a heavy weight in our hand more slowly than we let it down. In one case we are pulling against gravitation and exerting a greater force than gravitation in the other case we are only exerting a comparatively little force against gravitation so that the weight shall not fall down to the ground too quickly.

This difference—whether we walk against gravitation or with it—shows in another way. It is not much use for a stout man who wishes to get thinner to walk on the level. Let him walk uphill and he will soon find that he requires to turn away a lot of his fat to provide the power that will lift his body against the earth's pull.

**WHY ARE WE ON LY WHEN LOOKING DOWN FROM A GREAT HEIGHT?**

Everyone does it. The ordinary school boy looking down and anyone who is in poor health can learn in time by practice how to look down from a height without turning giddy. The explanation is that of this giddiness. One is the general explanation that the fear of falling disturbs the working of the brain. Now our sense of balance is a delicate feeling that we are out of balance or which depends upon the proper working of the brain and so the fear of falling disturbs the working of the brain and so the feeling of being out of balance is increased.

But it is also true that the least afraid of who fall at all expect to be afraid only of falling when

they look down from a height, and there is a very interesting explanation of this. Part of our power of balancing ourselves depends upon vision. We know how one is apt to bump against a companion when walking at night, for instance. And even though we can balance ourselves without the aid of sight yet we are very apt to feel giddy if our eyes play us any tricks, and that is what they do sometimes at a height.

**WHY, WHEN WE LOOK FROM A GREAT HEIGHT, DO THINGS SEEM BLURRED?**

As a rule anything we look down to see is quite close to our eyes—a few inches when we are reading, for instance, or a few feet when we look at the ground, and it is the rule that when we look at anything near, our two eyes turn inwards towards each other slightly, or converge, as we say. The eyes are so accustomed to converging when they look downwards—as the things they look down on are usually near, and as the two eyes cannot see a near thing well unless they converge slightly in looking at it—that they do the same when we are on a height, and perhaps the nearest thing is the ground, hundreds of feet below us.

In order to see a thing so far away, our eyes should look straight out, parallel with each other. But until we have learnt to go on high places, the eyes converge, and so are bound to give us a blurred view of the ground. Then we feel that we cannot see properly and become frightened and giddy. This is what students of the eyes believe, but we ought really to make experiments with people who hold the hand over one eye when they go on high places, and to see whether they feel more comfortable when they do so.

**HOW CAN PLANTS GROW ON A BARE WALL?**

One of the most important parts of the food of green plants is found, as we know, in the air. That is the carbonic acid gas, which provides the plant with its carbon. But that, of course, is not all. The plant must have water, and it must have salts. Now, a bare wall is not as bare as we think it, when we come to examine it closely. In the first place, rain falls upon it, and so the plant gets its water. Nor is this all. Rain itself contains minute quantities of salts which are valuable to the plant, and as it trickles down the wall, it gains more.

It has the power of melting, out of the wall, salts that may be contained, for instance, in the mortar. We know that lime is very valuable for plants, and mortar is really a kind of lime. So we find on examination that plants can obtain, even growing on a bare wall, those things that are necessary for their life. But, of course, the supplies of certain essentials are very scanty, and the forms of plant life which can grow in this fashion are very humble, and never reach a large size. Very different is the case of the plant that grows over the bare wall, but has its roots in the earth, from which it draws nourishment.

**WHY DOES THE BOOMERANG COME BACK?**

Some people suppose that the boomerang comes back after hitting what it is aimed at. That would really be very convenient indeed when the instrument is used in the chase, but it does not happen. The first part of the boomerang's path is straight, or practically straight. It is expected to hit its object while it is in this part of its path. If the boomerang were flying through nothing, it would have to fly *always* in a straight line, according to Newton's great law of motion.

But the boomerang is flying through air, and it is so shaped that the air resists one part of it more than another, so that it has to travel in a curved path after its speed has slowed down below a certain rate. As it travels in a curve, it *more or less* comes back to the place it started from. Endless study has been devoted to finding why the boomerang must be its exact shape, what are the consequences if its shape is a little different, what is the speed at which it begins to curve, how its weight and size affect the curve, and what is the relation between the curves of the boomerang itself and the size of the curve it makes in the air. But these questions are immensely difficult, and still undecided. If the boomerang, instead of being *gradually* slowed down, is arrested entirely in its flight, as when it hits something, it simply drops "dead," as we might say. Perhaps the most wonderful thing about the boomerang is the fact that it has been brought to perfection among the natives of Australia, who are almost the lowest race of mankind.

The next Questions are on page 3539.



## A SECOND TALK ABOUT TREES

### WHAT TREES DO FOR ENGLAND

WHEN we enter a great building like Westminster Abbey we are so surrounded by the magnificence of masonry that we are apt to forget the wooden doors which let us in. These wooden doors close at night the lock is turned they guard the abbey they shut out the world the mighty dead rest safely in their graves because of them. The finest guards the rock.

How the brain works looking at these old carved and moulded doors and thinking of the day when they grew in some English forest their roots hidden underground their branches swaying in the wind their leaves making a pleasant rustle in the summer air. Birds built their nests in them long before the Wars of the Roses. The woodpecker tapped at them talking to the Shrikes and wakened the Strutt and the other birds to St. Mary's square. The rain came down the land they will be here when you are old and our children's children have passed away forever from this world.

Those old doors of the abbey. Does the sun ever enter there or be there the great key in the lock of the door

men who have fastened those doors before him and who are now dust of the earth? Does he ever realise that he is standing in the woodland of the Abbey? Does he sometimes think that he is the sap rising that he feels the chequered shade of leaves on his face that he sees birds building their nests in the branches. No! A good man has but one business with these doors to turn the key. He does that faithfully and will turn it will and fight with him.

There is a story that it is good to look up a tree that is old and those immortal trees that live by the wayside. They are old and they are old. Have we ever thought of that? If we have we are not our English trees. The water came with his team of water.

As a little tree in the forest is a tree. The tree of the forest is a tree. No man will ever care to cut down a tree. They are old and strong and strong in the world. The water came with his team of water. The tree of the forest is a tree. No man will ever care to cut down a tree. They are old and strong and strong in the world.



## THE CHILD'S BOOK OF FAMILIAR THINGS

Let us read these great words

May the Great God, whom I worship, grant to my country, and for the benefit of I hope in general, a great and glorious victory, and may no misconduct in anyone tarnish it, and my humanity after victory be the predominant feature in the British fleet! For myself individually, I commit my life to Him that made me, and may His blessing alight on my endeavours for serving my country faithfully! To Him I resign myself and the just cause which is intrusted to me to defend  
Amen Amen Amen

They were written on the morning of October 21, 1805, in sight of the fleets of France and Spain, in a bay called Trafalgar. They were written by Nelson. At sea? Yes, and yet in a forest.

### THE OAKS FROM ENGLISH FIELDS THAT CARRIED NELSON AT TRAFALGAR

Oaks from English fields, under which children had played for many a generation, and at whose spreading base pimperns grew all wet with April rains, formed the walls of that house in which Nelson sat writing. Were they ever more beautiful in the forest than on that immortal morning when, with crowding sail, they swept towards Napoleon's challenge, and Nelson stood there in his admiral's frock-coat with the four stars of honour on his left breast, the empty sleeve pinned near them, asking Captain Blackwood if another signal were not needed?

Captain Blackwood made answer that he thought the whole fleet seemed very clearly to understand what they were about. These words were scarcely spoken before that signal was made which will be remembered as long as the language of England shall endure—Nelson's last signal: "England expects every man to do his duty!"

Oaks of England bore him in their arms when in a divine moment of inspiration he made himself England, and spoke for England to her sailors. Can we not hear the voice of English oaks in those words?

### THE TREES OF THE ENGLISH FOREST THAT LIVE FOR EVER

Dead trees? The beautiful lichen and the glorious bark stripped off, trees no longer, but daubed with paint, black and white, hammered with nails fastened with iron, a ship, a fighting ship

of England! No, not dead trees, immortal trees, the oaks of England, our forests torn up from the soil of England and huddled at her enemies' woods in movement like the trees in the prophecy to Macbeth, yes, still trees, and trees that will live for ever. Let us read the story of that tremendous day, and ever after when we see an oak in the forest we shall seem to read there the name of Victory. We must remember, too, that our Dreadnoughts speed through the sea on the black wings of dead trees, which we call coal!

One likes to think, too, of the blind Milton groping his way with a stick cut from an English forest. He saw in his darkness a beam of light, which was Freedom, and he fumbled his way to it, tapping the invisible ground with his stick. Drake fought for England, Nelson fought for England, and Milton fought, too. He was one of the greatest minds that ever realised the full dignity of man, and ever hated those who would bind the human race in chains. He fought to set us free. Is it not one of the greatest pictures in England's gallery of heroes, that of the blind Milton groping his way with a stick? One likes to think it was cut from an oak which gave Nelson his Victory and his Téméraire.

### WHAT MILTON WROTE OF ENGLAND ON A TABLE OF ENGLISH OAK

It was on a table of English oak that this great Milton wrote of England. "Why else was this nation chosen before any other, that out of her, as out of Sion, should be proclaimed and sounded forth the first tidings and trumpet of Reformation to all Europe?" And from that day forward the march has been continued throughout all fields of our national life. Across the historic table of English oak in the House of Commons has been waged the war of Reformation, the war between tyranny and freedom, between truth and falsehood, between God and Mammon.

The architect learned from the forest to build his stately aisles and arch them in with graceful roof of stone. No building of grandeur but has its roots in the forest. Man has gone there to learn how to build. He has gone there for his spears, his bows, and his ships. Our long history is inseparably and for ever bound up with the forest.



## THE NATIONAL TREE OF BONNIE SCOTLAND



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# THE HOLLY WITH THE PRICKLY LEAVES



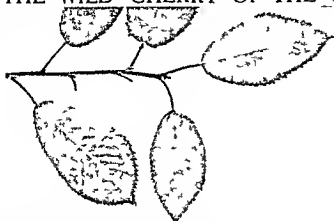
The white flowers of holly are very small, but, like the red berries that come later, they are very conspicuous because they grow together in such great numbers

Cattle like young holly leaves, and on the lower branches the spines are developed for protection. At the top of the tree, out of reach of animals, the leaves have no spines



We know holly best as a bush, but it grows to a tree, forty or fifty feet high, and when covered with the rich red berries is a magnificent sight. Evelyn, the well known writer, calls it "a glorious, refreshing object"

# THE WILD CHERRY OF THE COUNTRY-SIDE

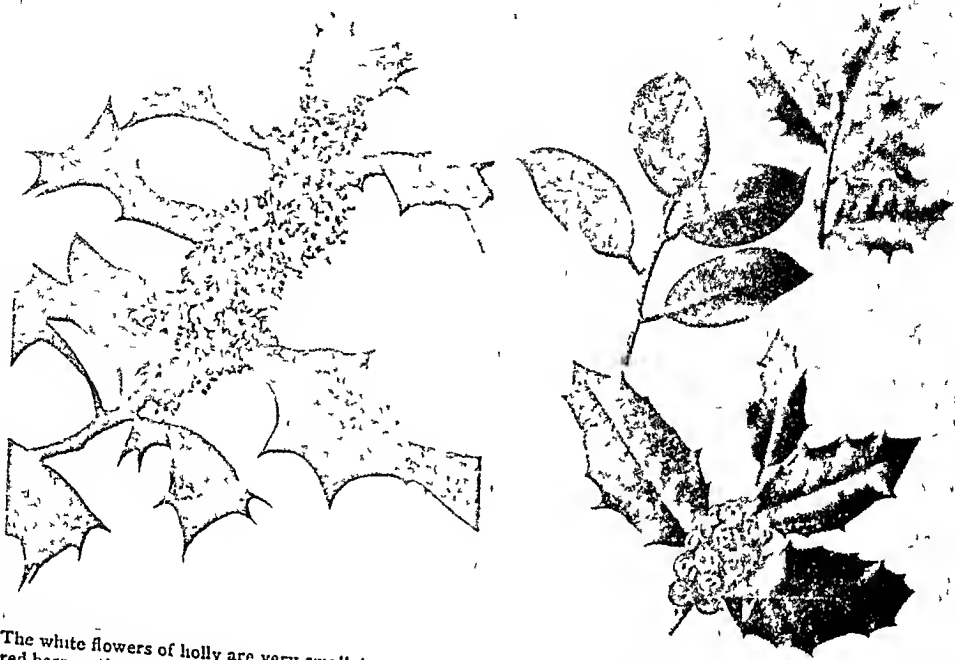


The leaves of the wild cherry tree are a deep bluish-green in colour and grow on long petioles. When the tree is in bloom it is covered with masses of delicate cup-shaped flowers. The fruit is a small, round, fleshy drupe.



This is a fine specimen of the wild cherry-tree for growing in a park or garden. It is a native of the country and is now almost everywhere. The fruit is a small, round, fleshy drupe.

# THE HOLLY WITH THE PRICKLY LEAVES



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# THE WILD APPLE-TREE'S DAINTY BLOSSOM



The leaves of the wild apple-tree are very much like those of the apple-tree, but are much larger and are more serrated. The leaves are smooth on the upper surface, but sometimes they are under the

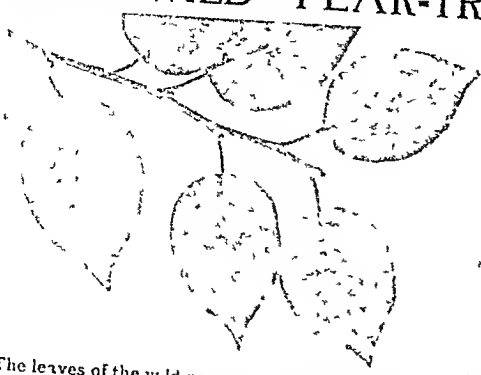


flowers that grow on the tree are very beautiful. The flowers of the wild apple-tree are small and are white with a delicate pink tinge.



We will now show you the wild apple-tree, which is the most common of the wild fruit-trees. It is a small tree, and is very common in some parts of the country. It is very hardy and is found in the most barren and rocky places. It is very common in the mountains of the West.

# THE WILD PEAR-TREE OF THE WOODS



The leaves of the wild pear are, in shape, very much like those of the wild apple and their under-surface is downy



The white flowers are clustered in groups of five, and the fruit that comes from them is rough and uneatable.



The wild pear tree, which is the origin of all the pears that we see in shops, is not so different from the wild pear tree, but where it grows it lives long. Stained with black, the wood is also exactly like ebony.



# THE WHITE-BEAM WITH THE RED BERRIES



The leaves of the white-beam are coarsely toothed at the edges, and the under-surface is covered with white down.



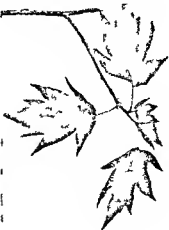
The white-beam's loose clusters of white flowers produce scarlet berries, called in the North chess-apples



The white beam is one of our less-known trees but it is very useful, because its hard wood is used for making cog-wheels in machinery where iron is not suitable. Birds and squirrels are very fond of the scarlet berries



# THE WILD SERVICE-TREE OF THE HEDGE

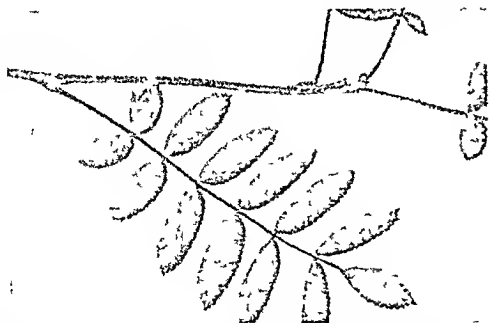


The flowers of the white-blossomed species are remarkably like those of the wild service-tree in fact the only difference is in the form of the other. The leaves of the two species, however, are quite different.



The wild service-tree is a very common shrub in the south of England, and is often seen in the hedgerows of the south. It is, though ornamental, it does not always grow very high. The greenish leaves are sometimes covered in flowers in spring, but the bark is rough and hard when it is old, and is sometimes covered by lichen.

# THE ASH-TREE THAT WAS USED FOR LUCK



The leaf of the mountain ash is like that of the ash, and thus it received its name, but really it has no relationship to the ash. This tree was once thought to bring luck.

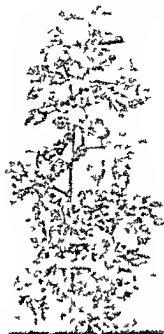


The delicate white flowers, with their fragrant smell, are like the hawthorn, only smaller, but we can see how different they are from the true ash on page 3192.



The mountain ash will grow almost anywhere in the poorest soil, and it is very common in London gardens. In olden days country people used to make ale from the scarlet berries. Its other name of rowan means "charm."

# THE HAWTHORN'S FRAGRANT BLOSSOM

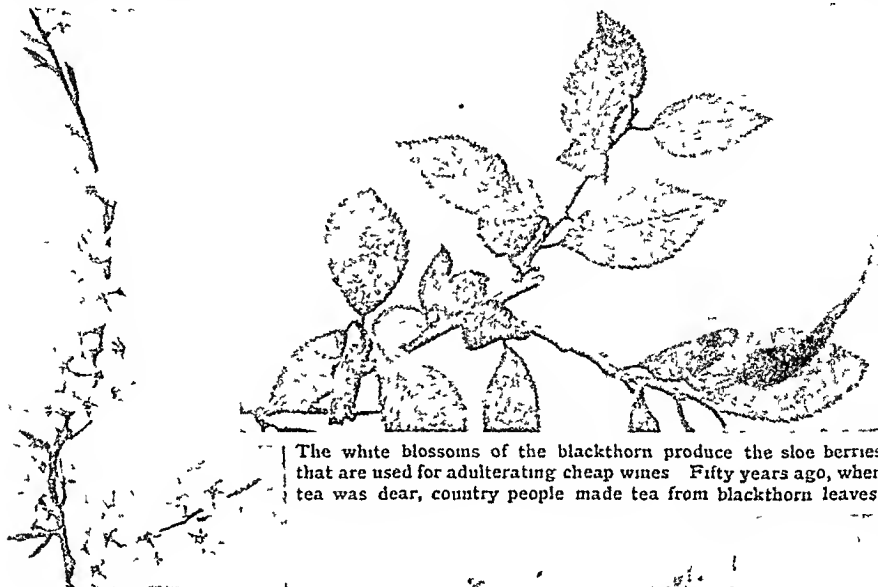


Hawthorn rarely grows larger than a bush in places where cattle have access because the animals will eat it. The hawthorn flower is the palest of all that are very fond of eating the leaves and young shoots. though some times it will be found tinged with pink.

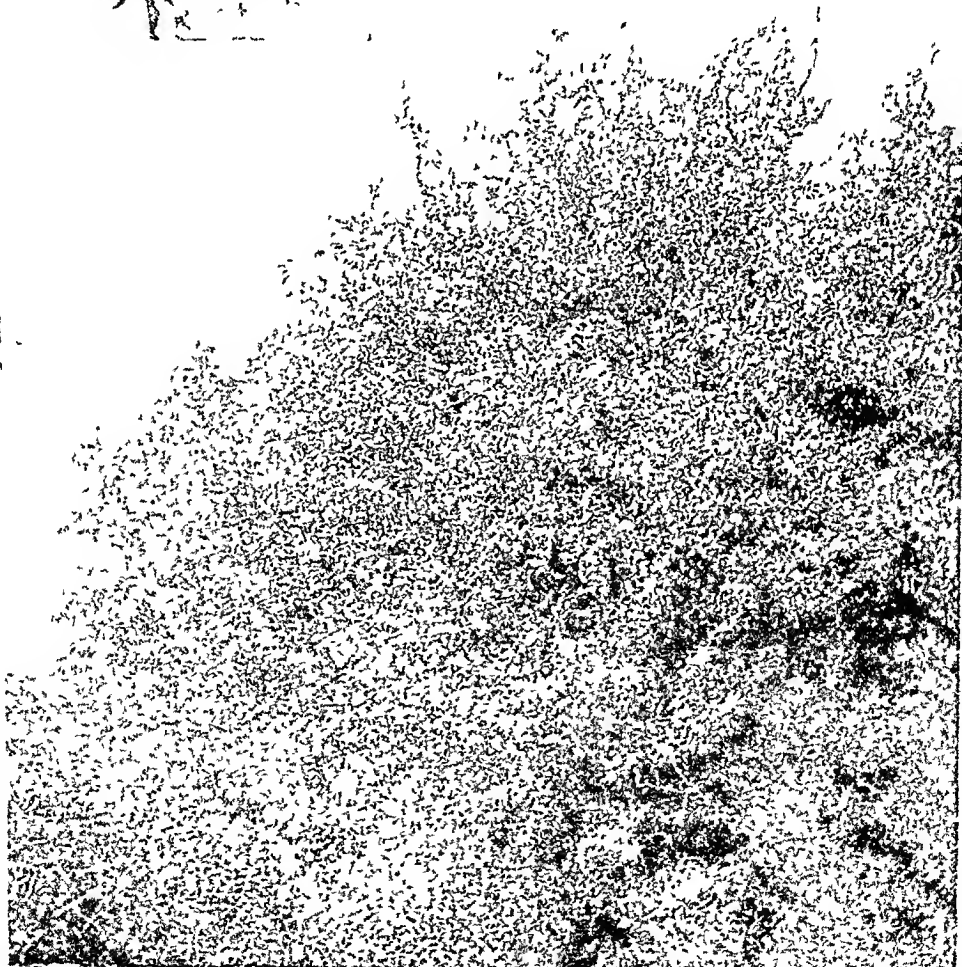


Although cattle are so fond of hawthorn, it makes good fencing for farms. It grows well from the sea to the hills and has a wet, large bush, but it is not so good as a hedge. It is also used for the purpose of making a fence. It is also used for the purpose of making a fence.

# THE BLACKTHORN THAT GIVES US SLOES

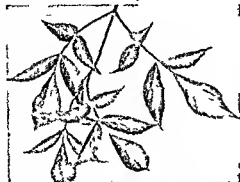


The white blossoms of the blackthorn produce the sloe berries that are used for adulterating cheap wines. Fifty years ago, when tea was dear, country people made tea from blackthorn leaves.



Blackthorn is not called by this name because its flowers are darker than those of the whitethorn, or hawthorn, for they are really whiter, but because the bark is nearly black. Blackthorn is used all over Cornwall for hedges.

# THE ELDER, THE TREE OF THE WAYSIDE



The elder is divided into five or six orders of leaflets. Here we can see only a few of them.

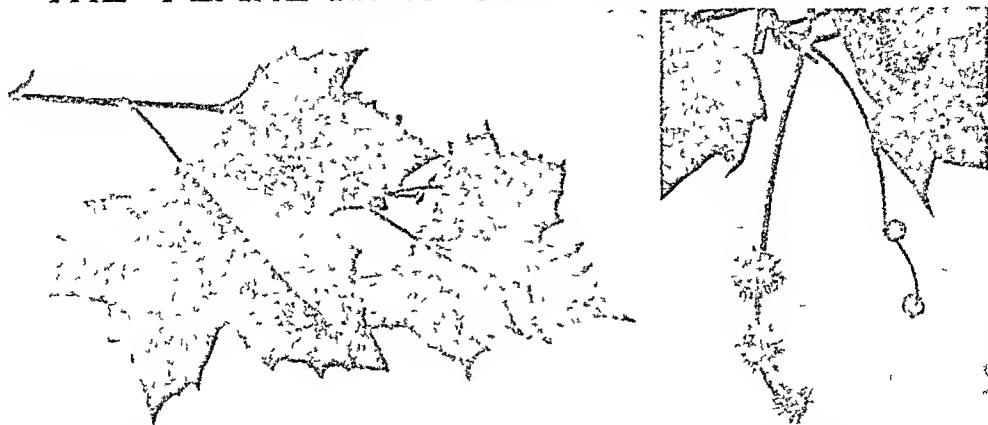


The elder tree is a very common tree in the country. It is a very useful tree for many purposes.



The elder tree is a very common tree in the country. It is a very useful tree for many purposes. The elder tree is a very common tree in the country. It is a very useful tree for many purposes.

# THE PLANE-TREE OF CITY AND TOWN



The broad leaves of the plane give the tree its name, for "plane" means "broad." The leaves are like those of the sycamore but the two trees are not related. The flowers grow in little round balls like old-fashioned buttons.



The plane is the most long-suffering of trees, for no amount of smoke and dirt seems to affect it. Even when the bark and leaves are covered with soot, the tree still flourishes, and this is why it is nearly always used for lining our city streets. All sorts of other trees have been tried for this purpose, but none flourishes like the plane.

# THE YEW-TREE OF THE CHURCHYARD

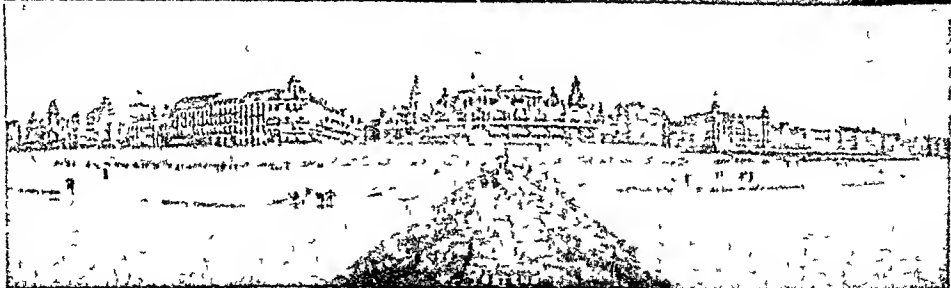
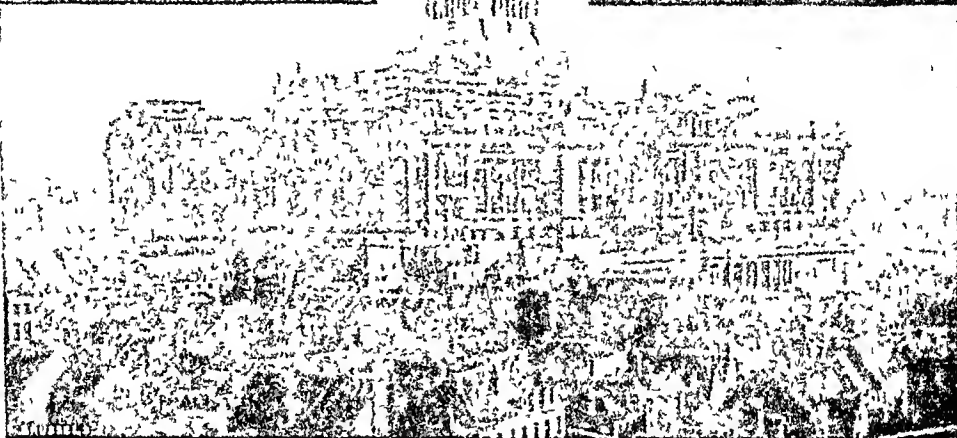


The leafy leaves of the yew which grow very closely together are poisonous to cattle and human beings, although the berries are not harmful. Often when yewhedges have been cut, and the leaves cast down as in the illustration have been found dead, having eaten the leaves. This picture shows the leaves and the small male cones.



They were an ancient breed of the British isles. One of the oldest yew trees in the world is the yew tree of the church of St. Martin, in the town of Colchester. Before the Reformation, yew trees were grown by royal command, because the tough strong wood was needed for making the long bows which the archers used who took part in the wars of the century and a half before the Reformation. A part of yew wood is still used for the same purpose as the yew tree, and the yew wood is still used for the same purpose.

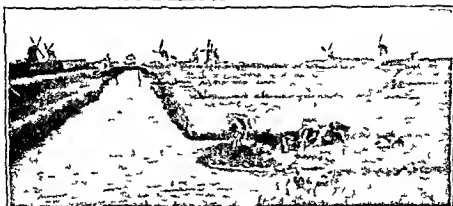
# CITIES AND PORTS OF BELGIUM & HOLLAND



There are some very handsome cities in Belgium, of which Brussels, a miniature Paris, and Ostend, the Belgian Brighton, easily take front rank. The Palais de Justice, or law courts, at Brussels, is one of the finest modern buildings in Europe, as may be seen from the picture of it on this page. Antwerp is one of the half-dozen greatest commercial ports in the world, and has an annual trade of a hundred million pounds. The great commercial ports of Holland, Amsterdam and Rotterdam, too, are among the most important seaports of the continent.



## The Child's Book of ALL COUNTRIES



1. Holland the water cuts the land in all directions, and the landscape is very richly dotted with windmills, that are largely used for the purpose of pumping and draining the land.

## HOLLAND AND BELGIUM

THE highest land in Europe and the lowest, are linked together by the River Rhine far away amid the mountains of Switzerland it starts on its long journey, leaping like a merry child till it passes into the quiet waters of Lake Constance. Then with growing strength it dashes and roars as it tumbles over the rocks at Schaffhausen and then flows in staid middle life rapidly and steadily northward useful and strong and beautiful for many many miles through Germany. After passing the grand gate of the Seven Mountains near Cologne, it goes slower as if age had come upon it and at last stretching out weary arms it seems to be limply searching for the sea in which to find its quiet home.

The triangle of low land on the shores of the North Sea between France and Germany—lying in the grasp of these arms of the Rhine and about the lower courses of the Meuse and the Scheldt where the great south plain of Europe is narrowest—has been known throughout as the Low Countries or the Netherlands. Either meaning, however small as the district is—not so large as Scotland—it has fallen into two distinct countries occasionally united under one rule through the centuries. Holland the hollow or marshy land the northern of the larger half with

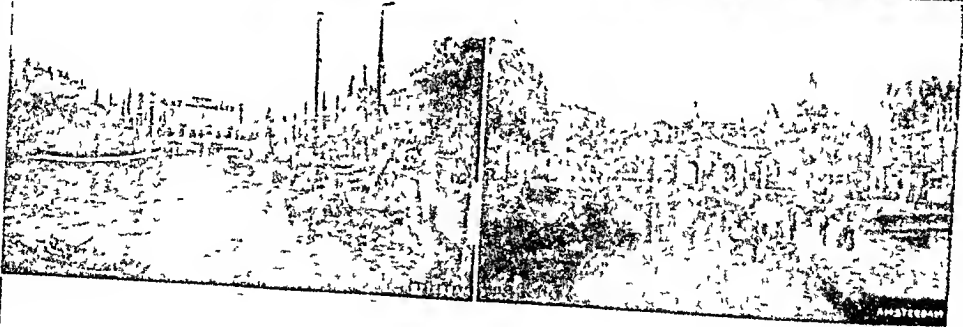
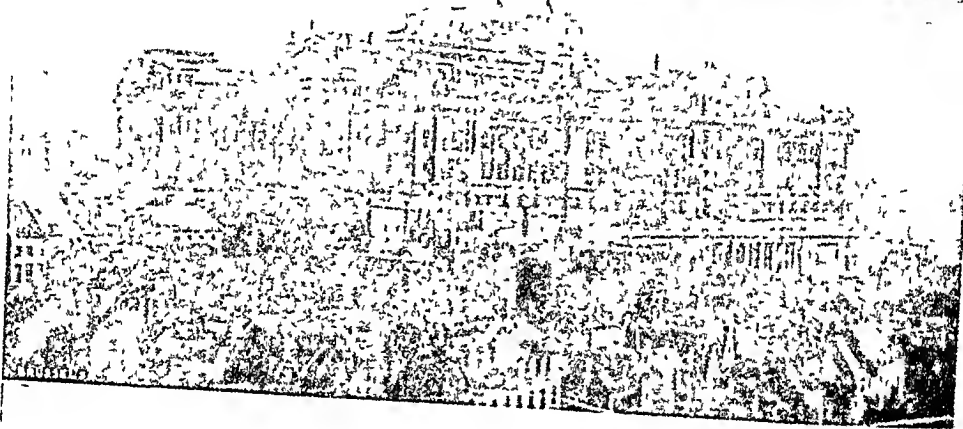
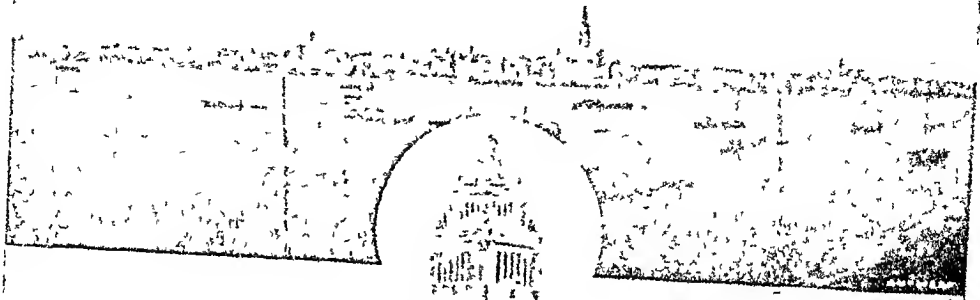


its rugged coast lies chiefly in the Rhine delta. Belgium to the south has but fifty miles of coast and consists of the lowland drained by the Meuse and Scheldt and the highlands of the Ardennes wooded hills about as high as the Cheviots.

It is a very favourite holiday trip now to go to the Ardennes from England. A quick passage of three and a half hours takes us from Dover to Ostend and from there we can either make a tour round the splendid old cities speaking vividly of the past and closely dotted over the fertile and busy plain with its wide sweeping rivers, or we can pass on to the beautiful walks and dachshund walks the fine views and interesting caves the road woods and bright streams of the hills beyond on the south coast.

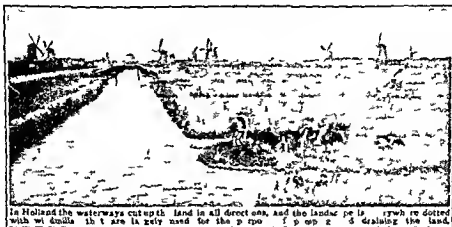
If we prefer a shorter voyage we can enter Belgium by the estuary of the Scheldt at Antwerp a very great port connected by rail and canal with not only the rest of Belgium but with the industrial towns of the Lower Rhine, about a hundred miles away and easy access to the place across the ocean which would be the raw material that it cannot grow itself. It is a small and short country, interestingly situated and with its capital Brussels, the French name

# CITIES AND PORTS OF BELGIUM & HOLLAND



There are some very handsome cities in Belgium, of which Brussels, a miniature Paris, and Ostend, the Belgian Brighton, easily take front rank. The Palais de Justice, or law courts, at Brussels, is one of the finest modern buildings in Europe, as may be seen from the picture of it on this page. Antwerp is one of the half-dozen greatest commercial ports in the world, and has an annual trade of a hundred million pounds. The great commercial ports of Holland, Amsterdam and Rotterdam, too, are among the most important seaports of the continent.

## The Child's Book of ALL COUNTRIES



In Holland the waterways cut up the land in all directions, and the landscape is everywhere dotted with windmills that are largely used for the purpose of draining the land.

## HOLLAND AND BELGIUM

THE highest land in Europe and the lowest are linked together by the River Rhine. Far away amid the mountains of Switzerland it starts on its long journey, leaping like a merry child, till it passes into the quiet waters of Lake Constance. Then with growing strength it dashes and rears as it tumbles over the rocks at Schaffhausen, and then flows in steady middle life rapidly and steadily northward, useful and strong and beautiful for many many miles through Germany. After passing the grand gate of the Seven Mountains near Cologne it goes slower as if age had come upon it, and at last stretching out weary arms it seems to be blindly searching for the sea in which to end its course in peace.

The triangle of low land on the shores of the North Sea between France and Germany—lying in the grasp of these arms of the Rhine and about the lower courses of the Meuse and the Scheldt where the great north plain of Europe is narrowest—has been known through history as the Low Countries, or the Netherlands, neither meaning lower than as the district is not so large as Scotland—it has fallen into two distinct countries occasionally united under one rule through the centuries. Holland the best watered and the northern and larger half with



its rugged coast lies chiefly in the Rhine delta. Belgium to the south has but fifty miles of coast and consists of the lowlands drained by the Meuse and Scheldt and the highlands of the Ardennes wooded hills about as high as the Cheviots.

Its very favourite holiday trip now to go to the Ardennes from England. A quick passage of three and a half hours takes us from Dover to Ostend and from there we can either make a tour round the splendid old cities speaking vividly of the past and closely dotted over the fertile and busy plain with its wide swelling rivers or we can pass on to the beautiful walks and cycle roads, the fine views and interesting caves, the cool woods and bright streams of the hills beyond on the south coast.

If we prefer a longer voyage we can enter Belgium by the estuary of the Scheldt to Antwerp, a very important port connected by rail and canal with not only the rest of Belgium but with the northernmost of the Lower Rhine. About a hundred miles away at Leuven we reach the place where the ocean waters of the North Sea meet the inland waters of the Scheldt. From Leuven we can go to Brussels and then to Antwerp, a city of great importance and interest, and from there to the capital of the country, Brussels.

so gay, and full of fine shops and handsome buildings, that it is sometimes called a miniature Paris

It is an easy journey to pass from Brussels to Holland, but if we go direct from England to its shores, we can land either at Flushing, on an island on the north bank of the Schelde, or at the Hook of Holland, on the north side of the Meuse, which leads to Rotterdam, the great port of Holland. The channel of the Meuse is the chief entrance to the Rhine.

#### THE DUTCHMAN'S BATTLE WITH THE SEA THAT HAS LASTED A THOUSAND YEARS

Between Flushing and the Hook are the numerous muddy islands formed by the sediments brought down by the great rivers, so here we have some of the earth of Switzerland, Germany, and France. North of Rotterdam are the Hague, the beautiful capital of Holland, Utrecht, Leyden, and Haarlem, so famous in history, and Amsterdam, Holland's largest city of commerce, on an arm of the Zuyder Zee. The Zuyder Zee is the youngest sea in the world, for it was formed only about 600 years ago, when the water burst in over the land, sweeping away villages and farms and the poor folk who lived in them. The greater part of Holland is below the level of the North Sea.

There is an old Dutch proverb "God made the sea, but we make the shore." For more than a thousand years the making of that shore has been the first duty and thought for those who, living in the land, wished to protect it, and enlarge its borders, against the storms and tides that dash against it.

As we travel through Holland to-day, we are astonished at the engineering skill that has grown through the centuries from perpetual battle with the water.

#### A LAND WHERE THE FISH SWIM ABOVE AND THE BIRDS FLY BELOW

Let us stand on one of the great dykes, or sea walls. It is perhaps sixty feet high, and broad enough at the top for a carriage road, bordered with trees and buildings. The sea laps quietly, though it may rage and roar to-morrow, not far below the level of this road, and boats come alongside to little piers and quays, but the other side slopes deep down to the green meadows, so that we on the dyke can see down the chimneys of the houses nestling on them below, and the fish on the one side are higher

than the birds on the trees on the other. Very strong, built of stones and cement and willow boughs, are these walls which push back the ocean, and constant care is needed to see that there is no leak, and that the various gates and sluices are in perfect order.

There are strong walls, too, round the lakes and on the banks of the rivers that become flooded when the snow melts in the distant Alps; and everywhere are canals and ditches cut to regulate the flow, and to help the land to keep its head above water. In many places, continuous pumping has to be carried on, and this is largely done by the windmills that are such a feature of the country. From the top of the dyke we can perhaps count twenty or more, for the Dutch make the most of the labour of that riotous giant, the wind, who often does so much mischief in the country.

Besides pumping and draining, the windmills saw up wood and grind corn. Many lakes are formed by the draining of the marshes, which has been done with enormous toil and skill, and as we pass from the Hague to Haarlem in the train, we see one of the largest *polders*, as the drained marshes are called, beautifully green and fertile.

#### A CITY BUILT ON ISLANDS, WITH CANALS IN THE STREETS AND 300 BRIDGES

If our visit is in the early summer, the reclaimed land will be brilliant with the lovely bulb flowers for which Holland is so famous. In most of the towns, canals run through the streets. Amsterdam, for instance, is built on almost as many islands as Venice, and the canals are crossed by 300 bridges. The soil is so moist that, generally, houses have to be built on a foundation previously made firm by driving in a number of piles. Erasmus, the great Greek scholar, who lived at Rotterdam, and did so much to prepare the Reformation, had this in his mind when he said that he knew a city in which people lived like crows on the tops of trees.

Holland is so flat that there is but one danger-board for cyclists in the whole country. If we mount the towers of any of the fine old cathedral churches we can see all round for miles, right away to the distant horizon. And a bright and wonderful view it is on a sunny day—quite dazzling, for the

water shines everywhere and so do the brass weathercocks and the steel railway lines and even the sails of the boats on the canals gleam against the green of the fields. It is so strange to see sails mixed up with trees especially when the rivers or canals are higher than the fields. And over all is the tenderest delicate light which Dutch artists know so well how to paint in their pictures.

If our visit to Holland is in the winter a very different scene meets our eye. Instead of the vivid green a mantle of white rests over all and the gleaming waters of the canals and ditches are frozen hard and are covered with skaters—doctors going to their patients children to school labourers to their work. The Dutch and our men are among the best skaters in the world, and our ten countries and the broads are very like Holland. We have many beautiful pictures by great Dutch artists such as Rembrandt, Rubens, Franz Hals in our National Gallery but in the cities of the Netherlands there are ten times as many



A SNAPSHOT IN A STREET OF HOLLAND

Although the people of Holland are indolent, no matter what we go, we can see the men standing about, day and night, in their big balloon-like breeches, making or talking

of the struggles by which the Netherlands have not only in the end kept their small corner of Europe independent but which have so strengthened and educated the people that for centuries they have been the world's teachers in most of the matters that are worth knowing.

The Low Countries formed but a dull damp district shut in by the gloomy depths of boundless forests when we first catch sight of them in the searchlight thrown by Roman civilisation. For countless ages the rivers which were everywhere numerous all over the land had been

steadily bringing down silt and mud and the wind and tide had been occasionally dispersing and destroying the banks thus formed. The early Celtic people who chose these shifting swamps for their home lived like beavers among the tangled brushwood on the islands at the mouth of the Rhine. The bravest of them were the Belgae who have left their name in Belgium and, when the Romans came

several German tribes of much the same stock

as our own forefathers had pushed out the Celts. Among them the Batavians and the Frisians were celebrated for bravery and love of freedom and their determination to protect the land on which they dwelt. The Batavians were of great use in the Roman times.

In the fourth century the Frisians came again over the land and the Batavians they absorbed. The Frisians and the Batavians were the tribes living in the north of the Netherlands at the time of the

Let us now for a while leave the busy and populous Belgium of to-day and the Holland so carefully walled and guarded from the ocean and glare of the stars extending over 2000 years

country fell under the rule of the great Charlemagne. He left the people their native customs, and put chiefs over them as his delegates, whom they had to obey. Part of Charlemagne's plan was to give wealth and power to the bishops of the newly Christianised tribes and for nearly a thousand years these prince-bishops were very important. After Charlemagne's death the great empire broke up, and under the weak rulers that followed, the independent nobles became ever stronger. There were the Bishops of Utrecht, where was the first Christian Church, the Counts of Holland—Holland being originally a province, which later gave its name to the country.

The Dukes of Brabant and the Earls of Flanders—William of Normandy took his bride from Flanders—were very important nobles as well as the lords of Hamault, which also gave us an English queen, of whom we read on page 1253. Other small states were Guelderland and Friesland. The old laws of the Frisians declare that the race shall be free, as long as the wind blows out of the clouds and the world stands, and this principle has always been kept in view even in times of overwhelming trouble.

#### THE RISE TO WEALTH AND POWER OF THE CITIES OF THE NETHERLANDS

These were the bad old feudal days, when the nobles were for ever quarrelling amongst themselves, and, according to their opportunities, doing their best to take away the liberties of the people. The prince-bishops gained more and more power over men's minds, till no one dared to think for himself.

We know how the rise of important towns has always helped on the cause of freedom, and though the towns in the Netherlands are not quite so old as some in France, Italy, and Germany, most of them date from early times. When trade was set moving by the impulse of the Crusades, the towns of the great north and south route began to rise from small beginnings to wealth and power. In the thirteenth to the fifteenth century, the towns of the Netherlands did much business with the towns of the famous Hanseatic League, of which we read on page 2526. In the fourteenth century there were over 3,000 woollen factories

around Malmes, now the centre of the Belgian railway lines, Ghent had 40,000 weavers, and the goldsmiths of Bruges were numerous enough to form a regiment by themselves in time of war. The towns of Delft, Haarlem, Rotterdam, Amsterdam, were all growing, though often devastated by the endless quarrels of landowners and townsmen.

#### HOW ENGLAND GREW WOOL FOR THE FLEMISH LOOMS

It was at this time that England grew so much wool for Flemish looms. Linen, too, of various kinds was added to the manufactures. Holland, that stout material we use so much for pinafores and curtains, still bears the name of the country where it has always been largely made.

But all the time when the trade and industry were growing, amidst constant scenes of violence and fighting in the streets of the flourishing towns, the struggle against the elements for possession of the country was ever going on. Did the fierce winds heap up the sand-hills on the shore, the Netherlands planted coarse grass to bind it together to make a rampart against further encroachment. Did the river overflow its banks, they were strengthened and heightened, and so by degrees, by patient trial and endeavour, that wonderful skill was attained in building dykes to withstand even the onward rush of the stormy tide, and in making canals and draining lakes. Sometimes, as we have seen, the giant ocean had his way. It was in the thirteenth century that he rushed inland and formed the Zuyder Zee. For years past plans have been maturing to drain this great body of water and restore the land to cultivation.

#### THE MAKING OF THE DUTCH RACE AND ITS GREAT FIGHT AGAINST TYRANNY

All this effort for generations produced a wise and determined race, few in numbers, and living in a small country, yet able to resist in the fifteenth and sixteenth centuries the fierce tyranny of the most powerful of the sovereigns of Europe.

For a dark cloud began to grow over the Netherlands when by seizure, purchase, succession, marriage of heiresses, the most considerable of its states passed under the sway of the Dukes of Burgundy. We read on page 2966 how these dukes wished to annex

# PEOPLE OF THE NETHERLANDS LONG AGO



This picture by one of the old Flemish masters shows the doctor in the middle of the 17th century. The figures whose portraits we see in the main group are the family of the doctor.



Here we see the life of the Dutch town in the day when the Dutch were at the height of their prosperity.



The house of the old Flemish merchant was plain, cozy dwelling. He entered through the courtyard.



The painting of a bourgeois (or a bourgeois) with his wife and family shows the domestic life of the Dutch in the 17th century. We see the customs of a good and old man of the time.

Switzerland as well as the Netherlands and make one long independent kingdom between France and Germany. The crafty Louis XI had very much to say about this, and was at constant warfare with Duke Charles the Bold. From the daughter and sole heiress of this bad as well as bold man were wrested charters of privileges, commonly called the Great Charter—afterwards the foundation of greater liberty by the first regular assembly of the States General, the members of which were sent from the provinces and great cities of the Netherlands.

This young duchess, Mary, married Maximilian of the Hapsburg family, Duke of Austria, and later Holy Roman Emperor. Their son, Philip, succeeded to his mother's dominions, and he married Joanna, the daughter of Ferdinand and Isabella of Spain, elder sister of Catherine of Aragon.

This son was the famous Charles V, who gathered into his hand the rule of the Netherlands with that of Spain and Austria. All these countries hated each other, and the liberties of the Netherlands were in terrible danger from a prince who firmly believed that he had the sole right of disposing of the persons and lives of his subjects, as well as settling their faith and religion.

#### THE SPANISH TYRANT WHO PERSECUTED THE PEOPLE OF THE NETHERLANDS

Charles, in spite of his wide empire, was always in want of money, and he required the rich cities of the Netherlands, especially of Ghent, to furnish it whenever he chose to ask for it, and when denied, took away all the charters and rights of those who opposed him, and fined and executed the citizens. Hard as this was, especially when trade from different causes did not bring in so much wealth as formerly, it was not to be compared with the suffering brought upon the country through Charles's tyranny in matters of religion.

We know how the teaching of Luther raised a storm in Germany and in England. That of Calvin, another reformer, powerfully affected France and the Netherlands, and in these countries the rulers hated and feared the Protestants not only because their beliefs went against the supreme power of the Church, but because they denied the absolute power of the

rulers themselves; and so as the Netherlanders became more and more convinced that the Reformation was right, and bent all the strength of their determined natures to uphold it, the more bitter became the persecution of those in power, in order to stamp it out. Charles established the terrible Inquisition in the Netherlands, and thousands of reformers were burnt under his orders.

#### A MAN WITHOUT PITY, WHO SENTENCED A WHOLE NATION TO DEATH

His son, Philip II, carried out his father's plan only too well, and when the unhappy people prepared to rise in revolt against his cruelties and extortions, he sent the Duke of Alva, a most clever soldier, and a man absolutely without pity, to suppress them. Almost the entire population of the Netherlands was sentenced to death without even the form of a trial, and people were suddenly seized and put to death without farther warning, till there was not a family who was not bereft.

A national hero rose up at this time, William the Silent, Prince of Orange. His ancestors had done good service to the House of Burgundy, and William was brought up under the eyes of Charles V. When the worn-out emperor laid down all his crowns to go into a monastery, it was on William's arm that he entered the great hall at Brussels, capital of the Duchy of Brabant, where the brilliant ceremony of renunciation took place.

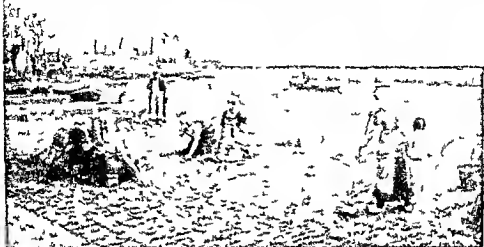
William very soon ceased to be friends with Philip of Spain, though for years he was called his lieutenant, and after he openly became a Protestant he was the leader of the opposition to the bloodthirsty Alva. The patriots called themselves, at first in grim joke, the Beggars. Sometimes they won, especially at sea, sometimes the Spaniards had the best of it, and the struggle went on for many years under different governors and generals.

#### HOW THE MEN OF LEYDEN CUT THE DYKES AND SAVED THEIR CITY

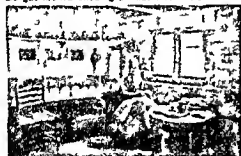
Stories of the heroism shown in this war of independence are told of nearly every town, every acre of the Low Countries. The sieges of Haarlem and of Leyden are amongst the most memorable. Leyden held out a whole year, except for a brief respite, and the



# EVERYDAY LIFE IN HOLLAND TO-DAY



The picture shows the life of the Dutch people to-day as well illustrated in the beautiful picture by M. G. H. Boigt N.R.A. showing a number of Dutch people working in the fields, and the wide and



The home of the Dutch are very quiet and clean, and there is no mistaking the national cost we find in the architecture and the style of the people.



Holland's splendid naval history and the great fact of the people to keep the sea from being their enemy, proves that the Dutch are by natural instinct masters of the sea. The Dutch children are, from childhood, perfectly at home in the water as may be seen from this picture of boys and girls playing in the sea.

The Dutch people are very quiet and clean, and there is no mistaking the national cost we find in the architecture and the style of the people.

heroic defenders were reduced to awful starvation, but still would not give in. There were fights on the slippery ice in the bitter winter. As a last resource, the dykes were cut, and the water flowed over the hardly won fields, sending the Spaniards away in haste lest they should be drowned, but now the ships that had been waiting almost within sight could come right up to the walls of the town, bearing the precious food to the starving inhabitants.

After a while the provinces of Holland and Zealand united, and when they felt strong enough they took the important step of renouncing in words the authority of Philip Elizabeth of England, of whom we read on page 804, helped them cautiously. One of the bravest of the English volunteers who pressed across the North Sea to help the Netherlands was Sir Philip Sidney, whose story is told on page 433. It was he who, when dying, handed the precious cup of water, untasted, to another wounded man, saying, "Thy necessity is greater than mine."

#### HOW THE CHILDREN CRIED IN THE STREETS WHEN WILLIAM THE SILENT WAS KILLED

But scenes of wail, of sacking fine cities, of senseless cruelty in persecution, could not last for ever, and after several unsuccessful attempts at union among the provinces, and at making peace with Spain, in 1581, Dutch independence was declared. William the Silent, "Father William," as he was affectionately called, was the head of the new republic. It was nearly seventy years before Spain gave up all claims and titles, and acknowledged the complete independence of the Dutch.

Three years after the Declaration of Independence, the wisest man in Holland was murdered by a ruffian hired by Spain. As long as William the Silent lived he was the guiding star of a brave nation, and when he died the little children cried in the streets.

War still went on under his son, Maurice, and the southern states, with their great towns of Antwerp and Ghent, and many others, were reduced to obedience to Spain for many years after the northern states became free. Protestantism had been stamped out, the brave and clever Flemish workers had been driven away to Holland or to England, to their great and lasting

benefit, and the subdued country lay in poverty and exhaustion. Ten years after the rout and ruin of the Armada, started by the fire-ships and the storm off the coast of Flanders, Philip II. died, after a reign of 42 years.

#### PHILIP THE SECOND, ONE OF THE GREAT DESTROYERS OF MANKIND

He has been called the destroyer of mankind, for he sacrificed millions of lives to his ambition and superstition. We can think of him sitting at his desk in his palace in the Escorial, planning the affairs of the world—the oceans were to him but Spanish lakes—coolly arranging assassinations and executions, squaring his money matters—his bribes and his losses. And then his long day was done.

It was in 1600 that Queen Elizabeth formed an East India Company to trade abroad, as all commerce had been so hindered by the ambitious plans of Spain. Holland followed suit two years later. Much money was spent on fleets and ports and factories, and from these days the sailors of Holland—trained in the wild fishing-grounds of the North Sea—were to be found all over the world taking possession of the Spanish and Portuguese colonies, and often hotly contesting with the English. New Amsterdam, afterwards New York, was founded across the Atlantic, and to this day both city and people bear witness to the Dutch founders. The city of Batavia was founded in Java, called after the old island province, the kernel of the mother country, and the New Batavia is the headquarters of the Dutch colonial empire to this day. Amsterdam and Rotterdam and all the old cities now revived, as trade flowed in with the arrival of ships laden with "sugar and spice, and all that's nice," at the busy quays.

#### HOW THE LAKES AND MARSHES WERE CHANGED INTO RICH MEADOW LANDS

As soon as peace gave leisure, pumping works were established to drain lakes and marshes, and the rich meadow land thus gained fed the finest cattle in Europe. Dutch butter and cheese have long been famous all over the world. Other uses to which the land gained from the sea was put were to grow roots for food and various kinds of hay, besides bulbs of beautiful flowers like tulips. The Dutch taught all Europe

## HOLLAND AND BELGIUM

how to garden and farm. At this time too Holland became the printing house of Europe sending out thousands of books of history and travel, law and medicine. Trades too such as diamond cutting—still largely carried on at Amsterdam—gave employment to very large numbers of skilled workmen. It was in the seventeenth century

that the rivalry between the Dutch and English on the high seas came to a height. There were many famous admirals, many brave seamen on both sides. Van Tromp and De Ruyter are names as well known to us as Blake and Monk, and for years they tried to sweep each other off the narrow seas. London was in a panic when De Ruyter sailed up the Thames in the glorious days of

Charles II. and a meeting of the obstinate sea battles lasted for three or four days when both sides believed to a stake that never knew when it is beaten.

In the age of Louis XIV. France made several conquests in the Spanish Netherlands which had passed to Austria, and Holland too had its share of its change of reign. To save the country the dikes were never

Later the waters froze and when the French troops were marching over the ice to attack the Hague a sudden thaw alone saved the country from destruction. The head of the republic at this time was the great grandson of William the Silent. His name was also William and he married Mary the daughter of our James II. When England could no

longer bear the tyranny of the Stuarts William with his wife was invited over to be king in James's place. He helped to restore old laws and liberties and to strengthen the position of the reformed religion. In the eighteenth century the importance of the united provinces of the Dutch Republic became less than it had been in the seventeenth and there were many disturbances in the



led to the independence of the Kingdom of the Netherlands. But the French Revolution was at hand, and in 1795 the country was completely conquered and became a French province. The seven united provinces were merged into the Batavian Republic. In 1815, after the Napoleonic wars, the country was restored to the Kingdom of the Netherlands.

not last long. He soon took his brother away, and joined Holland and all the other provinces to France. "They are but the sediments of French rivers," said he, "and therefore clearly belong to me." The decisive battle, about which we read on pages 1009 and 2480, which confirmed the downfall of Napoleon, was fought at Waterloo, not far from Brussels.

### THE BIRTH OF THE MODERN KINGDOM OF BELGIUM

When the Congress at Vienna remade the map of Europe, the whole of the Netherlands was joined into a single kingdom under another William, Prince of Orange. But the northern and southern provinces did not agree about religion—the south being chiefly Roman Catholic—and they differed on many other matters, too, so, in 1830, they revolted, and the old Spanish Netherlands, that were afterwards Austrian, became the Kingdom of Belgium, under a German Prince, Leopold of Coburg.

The northern provinces went on as the Kingdom of the Netherlands, or Holland, under the Prince of Orange. The descendants of Leopold and William are still on the thrones of the two countries.

Belgium has made immense strides in the course of years, and is now one of the most densely populated countries in the world. The great coalfield of the north of France passes into Belgium where the railway lines are so thick, and there are mines of iron and zinc and factories of all kinds, where thousands of people toil hard. Liège, on the Meuse, is a great engineering centre, and in many towns linen is made from flax grown in the neighbourhood, and bleached with the waters of the rivers.

Ghent is the chief textile centre, making both cotton and woollen goods. Great quantities of sugar are made from the beetroots that grow in the fields. Belgium is also famous for fine lace.

### A WONDERFUL PRINTING-HOUSE THAT HAS REMAINED UNCHANGED FOR 300 YEARS

It is a wonderful sight to watch the shipping from all parts of the world at Antwerp, from whose quays and docks the industrious kingdom sends away a great deal of its work, and receives the greater part of its raw material.

Among the surpassing interests of Antwerp is the famous old printing-house, the Musée Plantin, with the

types and tools all left in their places, just as they were used in the sixteenth century when the firm of Plantin printed prayer-books for Philip II.

In the cities of both Belgium and Holland the story of the past is perpetually before our eyes. Fine cathedrals and churches, grand town halls and buildings of all kinds, together with the pictures and relics they contain, are like speaking witnesses which link the past with the present.

Between Amsterdam and the sea is the famous North Sea canal, which saves ships going round the peninsula of North Holland. It is about fifteen miles long. Both at Amsterdam and Rotterdam the trade is enormous, and deeply interesting are the pictures and collections, especially at the Ryks Museum at Amsterdam. Here are not only models of the ships that swept the seas in the time of Cromwell and Charles II, but some British colours, and a piece of the Royal Charles, captured by the Dutch at Chatham. The portrait of De Ruyter is close by.

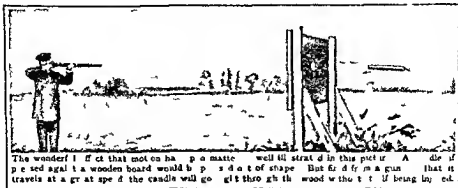
### WATER, WATER, EVERYWHERE, BUT NOT A DROP TO DRINK

Let us now mount the Cathedral Tower at Utrecht, and as we look over the wide view, at the dykes, the canals, the windmills, the cultivated fields, the busy towns, we think again of the centuries that have passed since the Batavians settled in the island held in the arms of the Rhine.

Holland is one of the oddest and most amusing countries in the world. Though water is everywhere, there is often not a drop fit to drink, and people have to buy it by the pailful, as they often buy some firing to boil their kettles. From the high dykes frogs can look down on the birds, and in the damp fields the cows wear coats. Water omnibuses ply for fares on the canals, and coal and peat are brought by brown-sailed boats, which are hitched up to the door, like a horse. The peasants wear beautiful gold ornaments, and costly lace on their heads, and often perch a shabby French bonnet on the top of it. Dogs draw little carts with brass jars full of milk. The brass and copper shine like gold, and everything that can be scrubbed is scrubbed at least once a week, even the big stations.

The next story of Countries is on page 359.

# The Childs Story of THE EARTH



The wonder I find that not on ha p o matte well ill strat d in this pict ur A dle if p e s e agal t a wooden board would b p s d o t of shape But fir d fy m a gun that it travels at a gr at spe d the candle will go ght thro gh th wood w th u t t if being lay ed.

## HOW MOVEMENT CHANGES MATTER THE WONDERFUL FORCE OF MOVING THINGS

WE must now go on to another part of the story of the Earth. We have already a good idea of what the earth is and we have studied some of the other worlds in space in order to learn more about the world we live on. We have learnt also about the different kinds of elements that make up the earth and the sun and the stars and the way in which those elements combine with each other. If we are to use big words, then we can say that we have studied geology and astronomy and chemistry and geography—not the geography that deals with frontiers and cities, but natural or as it is called physical geography and lastly we have studied agriculture.

There still remains to us a very important and very big study the special name of which is physics—a name derived from the Greek word for Nature. By physics we now mean the study of motion heat light sound and electricity. Of course there is no real division between physics and some other sciences like chemistry and we can not understand the one without the other. Nature is not made in water tight compartments though I am afraid we often talk as if that were an fact as if it were. It is only for convenience and because we cannot see everything at once that we have to

study one thing at a time. Science will hall go on to study motion which is very much more interesting than perhaps it sounds.

When we look at the world around us or at our own bodies we find that there are two things to catch our eye matter and motion. In many parts of this book we read about matter what it is made of and the way it is put together to form rocks and planets and stars. We cannot say anything more about matter itself here except simply that we do not know much about it. Thirty years ago men thought they really did know all about matter. Now we know that all we have learnt—and we have learnt a great deal—is only just the beginning. But at any rate we know what we are talking of when we use the word matter and we mean to study the things that are called matter.

Now motion is not a thing in the sense that matter is and yet it is real. If a boy observe the flicker between holding a cricket ball in his hand and saying that cricket ball when it is hit and in the direction he will know that motion is real. Or if we notice the difference between our feet when we jump and a rock jumps into the water and when a boy first a great light we shall know that motion is real. We are beginning to believe that it is not a great and after

and that matter is really a state of motion of something that we call the ether.

This is so important, and new, and interesting that we must try to understand it. We believe that everywhere throughout the world there is something called the ether. People have laughed at it, and said it was just imagined, but it is probably the most real of all real things except mind. If mind, by means of which we learn about other things, is not real, then nothing is.

### HOW MOVEMENT HELPS TO MAKE LIGHT AND HEAT AND TO MAKE MATTER REAL

Now, when the ether is doing nothing, we are not aware of it, nothing happens, it might not be there. But when the ether begins to move—and it may move in many different ways—then many things begin to happen. That is one good reason for saying that motion is very real. If the ether moves in a particular way, as we shall learn afterwards, there is produced the thing we call light.

Light and radiant heat, the kinds of invisible light about which we shall learn, including the X-rays and also electricity and magnetism—all these are states of movement in the ether. Now, if we have the least idea of what these things count for in the world, it is quite evident that motion is a very real and important thing. But that is only just the very beginning of what there is to say about it. We are learning that not only the air, but hard matter, such as rock or steel, is also a state of motion in the ether—a different kind of motion from that which produces light and heat, but a state of motion nevertheless.

Heat, we know, means two things, the radiant heat which comes from the sun or a fire, and is a movement of the ether, and the heat of a hot object when we touch it. This last heat, we believe, is due to a to-and-fro movement—a vibration, as it is called—of the atoms and molecules in the hot thing. So this kind of heat also is due to motion.

### A CHAIN THAT SPINS AND BECOMES LIKE A HOOP OF SOLID STEEL

But now let us think a little further of what this means. As a rule, when a thing is made hot it gets bigger. This means that part of the size of the thing is due to its heat—that is to say, to motion. May it not be that the atoms and molecules themselves owe their existence to motion?

There are many experiments—and these are being increased every day—that make it probable that this is true. One of the most remarkable of these may be mentioned, and if we have a chance of seeing it done anywhere, we should certainly do so. Can we believe that the hardness, the stiffness, the firmness of a thing can be made simply by the fact that it is moving? If we could suppose this, then we could suppose that the movement of the ether could make it into matter—which we, of course, think of as something hard. Now, if we take a ring of chain, which, of course, simply lies in a heap huddled on the floor, and if we get hold of it in such a way that we can make it spin round at a tremendous rate, it becomes quite stiff, as if it were made of one piece of solid steel, and it will run for a long distance like a stiff hoop until the spinning, or rotation, of it has been exhausted, and then, of course, it will collapse into a little heap of links as at first. The rotation made a thing with no stiffness into a stiff thing.

### HOW A CANDLE CAN BE FIRED THROUGH A WOODEN DOOR

Another wonderful illustration of this is the firing of a candle through a wooden door, the motion imparted to the candle enabling it to make a hole through the wood without itself being injured.

Again, we may take a piece of quite soft tissue-paper, stretch it out and spin it at a great speed. It will cut anything we please, just like a knife. Yet it is only a piece of soft tissue-paper. We have made it hard by making it move. It is possible to show experiments like this, one after another, for an hour on end, every one of them showing that the properties which we think of, when we think of a piece of rock or stone, can be created in things that have no such properties, by making those things move in certain ways.

But by far the most wonderful experiments are those we make with rings of smoke. A smoker can blow from his lips rings of smoke, or we can inject smoke into a square box with a hole in it and an elastic back, and then by hitting the back we can knock rings of smoke out through the hole. These rings are just the same as the smoker makes, but much larger and more easy to observe. Before we can notice what these rings do, or can understand at all what

we see, we must learn two things. The first is that the smoke—that is to say, the little specks of stuff that make the ring visible—has nothing to do with the question. We cannot do without the specks, just because they make the ring visible. The real ring, however, is not a smoke ring, but an air ring. Equally good rings are made by hitting the box when we have burnt nothing in it, and we can blow as perfect rings from our mouths when we do not smoke as when we do. Very few people understand this. They think that the smoke is necessary, but the smoke merely shows us the ring.

The second thing to remember is that the ring of air, or gas, has another and distinct motion. It moves through the air we know for we can see that. But the point is that the portions of gas that make it up are themselves in movement, and this second movement is something like that which we get if we take an india rubber ring, and run it along a rod which it fits tightly. The ring keeps on turning itself inside out. Well, a smoke ring, as we call it, moves in this way, and the special name given to it on that account is, vortex ring. The word like many other English words with v, r, and t in them, means turning, and twisting.

**THE MARVEL OF A RING OF SMOKE THAT CANNOT BE DESTROYED**

So a smoke ring is really a portion of the air which, unlike the air around it, is in a peculiar state of motion, and we find that this peculiar state of motion gives it the most extraordinary properties. For one thing, it lasts a long time and retains its independence of the air around it, and it resists attempts to destroy it. We cannot cut it with a knife. If we try to do so, the ring dodges us. One ring may be blown through another, but we cannot make one ring smash another. Now all this and much more entirely depend upon the way in which the air that makes the rings is moving. This motion confers upon the rings the power of resistance. It makes them like the atoms of matter, very difficult to destroy. It gives them a sort of freedom, just as the spinning of the steel chain gives it hard work. Lord Kelvin the great scientist has shown that the great force which we supposed that

matter may be made up of things like vortex rings. It may be that the ether by being put into a special state of motion becomes matter, just as by setting the air into a special state of motion we can turn parts of it into special separate things like smoke rings.

**THE WONDERFUL RING THAT MAY EXPLAIN THE MYSTERY OF THE UNIVERSE**

This vortex ring theory of matter is the most famous theory of the kind that has ever been suggested, and in all probability it expresses a great part, though doubtless not the whole of the truth. We shall agree that it justifies what was said at first, that perhaps motion is more important than matter. That must be so if motion makes matter. All over the world men are now studying the nature of matter from this point of view. The electrical theory of matter, which they are now studying, is really a sort of version of what we have been saying, and every year we shall hear more about this subject.

Meanwhile we must learn some other things which teach us how important motion is. When we stop a moving cricket ball we know that there is power in it, and that it requires power to stop it. Now the cricket ball is the same after it was stopped as it was before, but that power is no longer in it. Its motion was its power. When a train or a motor car or a flying machine moves we know the power is coming from somewhere. In every one of these cases the power is produced by the pressure of a gas that is somehow or other made in the engine of the machine.

A gas is made in such a way that it wants to expand or stretch itself, as it does so it drives the engine. This pressure of gases is one of the most important things in the world. Where does it come from? Many men working together and after each other have proved during the last century the truth of a beautiful theory that it came from the kinetic theory of gases.

**THE BILLIONS OF MOVING ATOMS OF GAS THAT DRIVE THE MOTOR CAR**

Everyone knows that a kinesiograph is a moving picture through we often spell it with a c and p, and so it as if it were an s, which only confuses us. The word comes from the Greek word for motion, and the kinetic theory of gases is only the

the theory that the pressure and the other properties of gases are due to the movement of the little atoms and molecules that make up the gas. This is now proved to be true. It is the little motions of unthinkable millions of molecules that make the big motion which we see of the train or the motor-car. It is the adding together of these tiny little motions that makes great masses of rock fly into the air when we cause an explosion, or that sinks a battleship when a torpedo, or submarine mine, explodes. Never was there such a good illustration of the proverb that "mony a mickle makes a muckle." Motion is power, and the big motions that we see, and all their power, are due to the little motions we cannot see. There is another most extraordinary thing which very few people have thought of, but which should make us interested in motion if nothing else does.

THE ONE AND ONLY THING THAT HUMAN BEINGS CAN EVER DO

Here are we human beings, who could not live for a minute without the motion of the blood in our bodies, and we are become the lords of the earth; we have changed its surface so much that men upon the moon could see the difference we have made. We rule other living creatures, have built great cities and ships, have learnt many of the secrets of the stars. And yet when we look upon ourselves and ask what it is that we can do, what it is by means of which mankind has done and will do everything, the answer is simply that we can move things. That seems absurd at first, but it is absolutely true. There is nothing that any human being has ever done, or ever can do, that does not depend upon his power to move things. All he can really do is to move his own body, in part or as a whole, and so, by pushing against other things outside him, he can scoop a hole in the earth and live in it, or put together machines that will build a palace.

We move our chest, and lips, and tongues, and so we speak, or we move our bodies to get hold of something that will make a mark, we move our fingers round that something, and then move it on something else, and so we write. We have done wonders, and we shall do much greater wonders yet, but all we can do is to *move things*.

The lesson to be learnt from this is how great the result of the mere movement of things may be. Indeed, just as all the doings of Nature depend upon movement, so do all the doings of man.

HOW WE ARE ABLE TO KNOW WHEN THINGS ARE MOVING

We have only to think of the apparent motion of the sky as the earth turns, or of the way in which we may be puzzled to know whether our train, or the train on the other line, is moving, to understand that we only know the movement of a thing by comparing it with something else. The only motion we can understand is relative motion. If there were just one point in the universe that could think, and there were nothing else in all space, that point could, of course, move about. But no one can imagine any means by which it could know that it was moving at all, much less the rate or direction of its motion. All we know, then, is motion as compared with something that is not moving, or that is not moving in the same way. Thus the whole universe of stars may be moving, but whether it is doing so, and, if so, in what direction and at what speed, no one can say, because there is nothing against which to test this motion. If the ground runs along under a runner as fast as he runs, how shall we measure his running? And this applies alike to trains, and stars, and everything else.

A solitary thinking *point* and not a thinking *person* has been suggested, and the reason for that was that there are two kinds of motion which a person might undergo, just as there are two kinds of motion which we see in a smoke ring. The smoke ring can move as a whole, and its parts can twist and turn among themselves.

HOW OUR BODIES ARE WHIRLED ALONG WHILE WE SIT QUIETLY IN A CHAIR

So we also can move about from place to place, or we can double ourselves up without moving away from where we were. If one of us were utterly alone in space, he could learn what motion was by moving his body about, but he would know no more of the motion of his body, as a whole, than we do when we sit quietly in a chair, not knowing that in every second of time our bodies are moving many miles with the earth. Motion from place to place is often called *loco-motion*, which just means—



place motion and we call a machine for producing such motion a *loco* motive. But the proper name for this kind of motion is *translation* and we compare that with *rotation*. Translation literally means carrying across; rotation we know means spinning and a thing may be undergoing either of these kinds of motion or both. When a cricket ball is bowled, the bowler usually so arranges that it has both a movement of translation which we can all see and a movement of rotation which we see the results of when a ball touches the ground or swerves in the air. As the earth flies through space it has both movements the translation making the seasons and the rotation making day and night. When translation of any body occurs rotation is quite difficult to avoid. Drop a book or a ball from a window and we find it very difficult to prevent it from twisting as it falls.

#### THE SLOW SWING OF THE EARTH UPON ITS AXIS

Along with these two kinds of movement there is a third which is a movement of vibration or trembling. This to-and-fro movement which we can feel in ourselves when we shiver is not the same as rotation. It is really a movement of translation but as it is constantly reversed, the moving thing does not change its place altogether. A wave is an instance of a movement of vibration and we must clearly understand what many people find difficult that the point is not the rate of the vibration. The to-and-fro movement may be millions of times a second or it may be only once a second or even slower still. The to-and-fro swing of the pendulum is a true vibration and would be a true vibration if it were a million times quicker or a million times slower. The axis of the earth seems to undergo a great vibration or to-and-fro movement which is quite distinct from its movement of translation and its movement of rotation and the period of this vibration—to use the proper term—is not one second as it may be with a pendulum nor yet less than a billionth of a second as it may be with a wave of light but also it may have thousand years. Yet it is a vibration. These three words that I have mentioned are used on we should always remember but when we think of motion

When we study the universe as a whole and find things in motion about us the first question we are bound to ask is Where does this power come from? The only answer to this question is that it comes from the great Cause and Author of all things. He is the first and ultimate cause of all motion.

#### THE GREAT LAW THAT MOTION AND POWER ARE NEVER LOST

If now we ask what are the nearer causes we make one great discovery which is the greatest discovery ever made by science and which is often referred to in this book and in every other book that deals with science at all. This discovery is that motion like power in all its other forms is never made out of nothing and never lost. This was guessed by the first of the Greek thinkers Thales some 2500 years ago and it was proved once for all in the nineteenth century.

Wherever we find motion there we know there must have been either some other motion of which this that we see is the continuance or else some power has been spent somewhere to produce it. When a ball leaves the arm the motion of the ball and the power of it have been derived from the power in the sugar of our muscles when the ball was thrown. And so in every case. This great principle which is true not only of motion but of everything else has a special name which is rather long but is not really difficult. It is called the *conservation of energy*. Energy is just a special word for power and the law of conservation states that power is never lost—it is also part of the law though the name does not say so that power is never made out of nothing.

One of the ways in which it shows itself is in what is known as Newton's first law of motion. Everyone should know this for it applies to everything. It is often called the law of inertia which simply means doing nothing.

#### WHY MOVING THINGS DO NOT GO ON MOVING FOR EVER

This law says that when a thing is moving it does nothing itself to change its motion. If the car will go on moving for ever and exactly the same speed unless and until we either power it past or turn it or make it go slower or faster. That is half of the law of inertia, but every body of it and it is

given first because it is the half that people usually forget when they talk about inertia. The half that most people know is really the same thing, but looks different. It is that when anything is at rest, it remains at rest, doing nothing, until something moves it. Whenever we think of inertia, or Newton's first law of motion, we should remember both halves of it, or, rather, the two ways in which it works out.

## WHY A BALL FALLS WHEN IT IS THROWN INTO THE AIR

Everyone understands how it applies to a thing that is not moving, but very few people remember how it applies in the other direction. They do not know that a thing which is moving will not stop unless something stops it. We see a ball thrown up into the air, or thrown over the surface of the earth, and we know that the motion ceases. This is our experience with practically all motions, and so we get the idea that when a thing moves it gets tired, after a time, and stops. It was one of the most tremendous discoveries ever made that this is not so, and that the smallest touch applied to the biggest thing, sufficient to move it at all, will keep it moving at that speed and in that direction for ever, without its ever getting tired. When the ball thrown up is stopped, the earth by its pull stops it, and the resistance of the air helps also in the stopping of the ball.

When a ball running along the ground stops, it does so, not because it has a tendency to stop, but because the resistance of the air and the friction of the ground stop it. The real tendency is for the thing that is at rest to remain at rest, and for the thing that is moving to go on moving. If we think of the matter, we shall see that if things did not behave in this way, the law of the conservation of energy would not be true.

## THE GREAT LAW OF NEWTON THAT EXPLAINS WHY THINGS STAND STILL

If things could be started moving without anything moving them, then power, or motion, would be made out of nothing; if moving things could be stopped without something stopping them, then motion, as we can easily see, would be made into nothing. That is what we mean when we say that Newton's law is really a special illustration of the great law of conservation

Newton discovered two more laws of motion, thus making three, which will always be known by his name. The second law is quite simple. It says that when anything is made to move, its motion is in strict proportion with the force that makes it. Further, the thing moves in the direction of the straight line in which the force acts. This is true, no matter if there be twenty different forces acting in different directions upon a body, and it is true whether that body be at rest or already in motion.

Using this law, it is possible for us to find out exactly in what direction, and at what rate, a body will move if we know the power and the direction of any number of forces that may be acting upon it. We discover also the profound truth that rest is a state of balance of forces, forces are pulling, but other forces are pushing. These exactly oppose each other, and so the result is rest. Gravitation is pulling this book as it lies on the table, but the strength of the table resists the force of gravitation, and as it acts in exactly the opposite direction to that force, the book remains at rest.

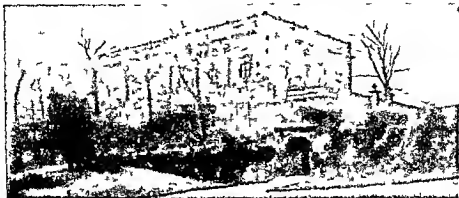
## HOW A GUN HELPS US TO UNDERSTAND THE LAWS OF MOTION

Newton's third law of motion is that "action and reaction are equal and opposite." This great law, which is really, when we come to examine it carefully, another version of the law of the conservation of energy, is very well illustrated in the kick, or recoil, of a gun when it is fired. The amount and force of the rifle as it kicks back are exactly equal and exactly opposite to the amount and force of the bullet as it goes forward.

We shall next have to name briefly three other laws of motion which we know by the name of Kepler's laws. We must not confuse them with Newton's laws, but they are in some ways just as important, because they lead up, as we shall see, to Newton's greatest discovery, the law of gravitation.

All these laws are of supreme importance, and though we may not be able to understand all their details, we should certainly know something about them, for the existence of the universe, including this world on which we live, depends upon them.

The next part of this is on page 3547



## THE HEROINE OF NOTTINGHAM CASTLE

ONE of the brightest stories from the Civil War is the story of the defence of Nottingham Castle by Colonel and Mrs Lucy Hutchinson. The building in the picture stands on the site of this famous old Norman castle. The king set up his standard on August 2, 1642 at Nottingham near which the Hutchinsons lived. The whole country was in a ferment and Ireton their neighbour and relative urged them to support the parliamentarians which they did. Mr Hutchinson received a commission as lieutenant colonel and the family removed to Nottingham for greater security. Soon as Governor of Nottingham Castle Colonel Hutchinson had to defend it.

For four years Mrs Hutchinson was shut up in the castle acting as surgeon during the siege, tending the sick, supplying food for the big household, medicine also where it was needed and ever cheerful and wise in her counsel.

She shared all her husband's plans, approved his stern refusal of the many attempts to bribe him into submission and showed in the notes she wrote down at the time that she must have witnessed scenes and undergone anxiety enough to quell the stoutest heart. There were few little children, two who needed her constant care. Newark a neighbouring town was in the royalist side and many of the

citizen of Nottingham were also royalists. One of them during the night secretly let

the Governor of Newark and six hundred soldiers into the town. Next morning the colonel found himself beset in his little fortress with eighty men. Enemies were all around but messengers got through and sent for succour to the garrisons at Derby and Leicester.

On the third day Colonel Hutchinson was invited to parley with the royalists in St Nicholas Church. His answer was to hoist a red flag on the tower of the castle and to fire his cannon at the church steeple. Two more days passed and then to their relief the watchers on the tower saw a party of horsemen galloping to their aid. As these men drew near the royalists retreated but not without a rally from the besieged, so that they retired in confusion.

When the war was over Mrs Hutchinson acted as peacemaker between a band of soldiers preparing to attack the town and the citizens arming for its defence. A short time when the Stuarts came back to power after Cromwell's death she worked to secure her husband's pardon. It was thankless and the brave wife died a disappointed woman. Her husband in 1660 was a second time in prison and she lived until his death.

## THE BOY WHO HAD NO NAME

Not many years ago, in 1845, there died a man who had become famous all over the world by the name of Frederick Douglass, and whose death was mourned by the millions. We say that to become famous by the name of Frederick Douglass, and by no other name, to suggest that that was not really his name. But is that true? He had to find a name for himself, as so many of the negroes in America had to do.

For it was in America, "the land of the free," as it is called, that Frederick Douglass was born in 1817, a slave. His father was a white man, a member of a wealthy family in Maryland, America. His mother was a poor slave woman. She was loving and kind, and in her simple manner she was a good mother to him. Slave though she was, he always honoured her memory, and declared that it was from that poor, miserable slave that he inherited his splendid brave and noble qualities. Of his father he could not speak with affection, for the man was a great villain, and cared less for his own little son than if the boy had been a dog. The boy's mother gave him the name of Bailey—it was a favourite name, for some reason or other, with the poor negroes of



FREDERICK DOUGLASS

America in those days. So many of them were Baileys, or Johnsons! Young Bailey had the same desperately sad life that all the slave children passed. He was allowed to live because some day he would be worth so many pounds to the man who owned him. He was not taught anything, but as he grew up he was put to work in a shipbuilding yard.

There he toiled till he was twenty-one. People did not then think it wicked that human beings should be slaves, but this son of a white man did think so, and the thought so burnt itself into his sad heart that, when he was twenty-one, he ran away from slavery. He escaped to New York, and from there to New Bedford, Massachusetts.

A good, kind man consented to give him work. When the runaway went to him, this good man had just been

reading Scott's poem, "The Lady of the Lake," and suggested Bailey to name himself Douglass, after one of the characters in the poem. It was probably the first time in history that a negro had borne a Scottish name.

Douglass now studied earnestly. He learned to read and write. When he was twenty-four he went to a meeting called for the purpose of protesting against slavery. Although he had had no training as a public speaker, he delivered so fine a speech that everybody marvelled, and he was at once appointed to lecture against slavery.

Douglass's stirring appeals were among the strongest influences in bringing about the movement which gave the slave their freedom. It was not easily done. The northern states of America, where all were free, had to go to war with their countrymen who lived in the southern states of America, where all the black people were slaves. It was one of the most terrible wars that have ever been fought, but in the end the good cause of the North triumphed, and the poor slaves were set free for ever. Once Douglass was travelling by steamer on a dreadful, stormy night. Because of his colour he was not allowed to go down into a

cabin, but had to remain shivering on deck. The captain took pity on him, and determined to get him shelter by a trick.

He looked closely at Douglass and said in a meaning tone:

"Let me see, you're an Indian?"

Had he been a Red Indian, an ignorant savage, the white people would have let him go into the cabins and saloons with them, and the kind-hearted captain wished him to pretend that he was one.

"You're an Indian, aren't you?" he said kindly.

"No, captain, I'm a negro," answered Douglass proudly; and all that night he stried on deck in a bitter blizzard, rather than tell a lie and deny that he belonged to the race for whom he toiled and suffered with such courage.

The next Golden Deeds are on page 3553

## The Child's Story of FAMOUS BOOKS

### THE NOVELS OF THACKERAY

THE first great success among the stories of Thackeray was that of *Pendennis*. It began to appear in instalments in November 1848, and had been preceded by 'Vanity Fair' which at first did not attract great attention, but had made the reputation of its author before it was finished. *Pendennis*, on the other hand, was a success from the beginning. It is a very long story describing the life of an imaginary young man, who is very far from being a hero as his faults are quite as pronounced as his good qualities and sometimes far more evident. The genius of the author is seen in the fact that, although he never endeavours seriously to win our affections on behalf of Arthur Pendennis, he maintains our interest continuously in his character which is the most difficult task of a novelist.

## THE HISTORY OF PENDENNIS

THE Arthur Pendennis with whom our story opens is not he whose history it attempts to tell. Major Arthur Pendennis was an elderly bachelor who having served his time in the king's army and retired on his pension contrived with much ingenuity to cut some figure among the dandies of his day although his means were of the scantiest. He just missed falling into the ranks of those who are known as the shabby genteel and being a perfect worshipper of rank and title he was ever to be found where anything was to be gained from association with people more wealthy and distinguished than himself. That is to say he lived a good deal on the credit which his familiarity with the noble men of the day earned for him in the minds of those who were not themselves favoured with the friendship of those great ones.

To be quite frank about the old dandy he was a good deal of a humbug. He even pretended in his manner of dress to be a great many years younger than he really was but despite his little whims and pretences most people liked the major and few members of his club were more in request than he at dinner parties.

Major Pendennis was seated one morning in his club with a little heap of letters before him most of which were from lords and ladies inviting him to honour them with his presence at their different parties and he was making mental notes as to how he could fit in the various engagements

which to accept and which to decline when all his plans were upset on opening the last letter of the heap. This was written by his nephew and namesake Arthur Pendennis and the reading of it sent the major purple with indignation. It is with this Arthur Pendennis that our story is concerned and later on we shall discover why his letter made the major so ill tempered.

A good many years before the day on which Arthur's letter was read by his uncle at his club in Pall Mall Mr John Pendennis the brother of the major and father of Arthur had carried on business as an apothecary and surgeon in a very unpretentious little shop in the city of Bath. John Pendennis was a quiet old fashioned, economical man and by dint of careful saving he was able at last to fulfil the dream of his life. Selling his business he bought a little estate near the small town of Clavering in the west of England, and settled down there for the remainder of his days as a real country gentleman.

His little estate was on the fringe of the greater one of Clavering Park and named it Laurook. Mr Pendennis felt that he could hold up his head with any of the landed proprietors in the district. He was well all the airs of a gentleman of 'ing a fine house, a few acres that went back to the time of the Normans, and his young wife who had been a Miss Helen Radenwood he had married because she was a very distant

although very poor, relative of the noble house of Bareacres

Thus the quaint little snob began quite late in life his new career as John Pendennis, Esquire, of Fair Oaks, Gentleman, his humble days when he dealt in drugs and porous plasters quite forgotten. Portraits of great Pendennises of the past, such as Roger, who fought at Agincourt, and Arthur, who carried himself so well at Cressy, and many another Pendennis hero hitherto unknown to fame, came from none knew where to adorn the walls of Fair Oaks mansion.

#### ARTHUR'S FATHER BECOMES A GENTLEMAN AND INVENTS HIS ANCESTORS

You will see that, like his brother the major, John Pendennis was also something of a humbug. The major had but little interest in him while he had been a mere apothecary, but as the Squire of Fair Oaks, he was proud of his brother, and delighted to see little Arthur growing up in the firm belief that he was the son of a long line of gentlemen.

Mrs Pendennis herself was a gentlemanly woman, who had a profound admiration for her elderly husband, and doted upon her boy Arthur. The result was that when Mr John Pendennis died, and Arthur had reached the age of sixteen, that young gentleman had been spoiled on all hands, and too suddenly became conscious of his own greatness as the new Squire of Fair Oaks. His uncle would have had him go back to Greyfriars School and continue his education, but Arthur coaxed his mother to let him remain at home, the lord of his estate.

#### SOMETHING ABOUT A YOUNG LADY OF IMPORTANCE IN THE STORY OF PENDENNIS

This was the beginning of his many follies, for his home studies were confined to some daily readings in the poets with Mr Smirke, the curate from Clavering, and the writing of passionate verses imitating the style of Byron, which were published in a local paper. For the rest, he fancied himself a very gay young man, interested in sport, and inclined to regard his mother and his adopted sister, Laura Bell, as very slow-going and old-fashioned, although he had a sincere love for them both.

As Laura plays an important part in the story, we should know something about her here. Long before Miss Helen Thistlewood had imagined she would

marry an elderly little gentleman with a bald head, there was a poor young graduate of Cambridge University with whom she was in love. But the Rev Frank Bell had so long to wait for a church that he and Helen drifted apart, and in the end he went abroad and married there.

It was after Helen had become Mrs Pendennis that both Mr Bell and his wife died, and their daughter Laura, who inherited a tiny fortune, was adopted by Mrs. Pendennis. She had proved herself worthy of Helen's love and care, and was now growing into a beautiful and adorable young woman. Laura's admiration for Pen, as her adopted brother was familiarly called, was so frank and whole-hearted that Helen nursed fond dreams of a great happiness she hoped to experience some day, when Laura might consent to please her by doing a certain thing. And in due time we shall discover whether Laura made her happy.

#### ARTHUR FANCIES HE IS IN LOVE AND BEHAVES VERY FOOLISHLY

We must now return to the doings of Pen, for that handsome young man was certainly as active as he was foolish; and his history, when fully told, is indeed a long one.

It happened one day that, when Pendennis was in the county town of Chatteris, whither he had ridden over to deliver a new poem to the editor of the local paper, he fell in with a very over-dressed and horsey young fellow named Foker, whom he had known at school. Harry Foker was no suitable companion for him, being densely stupid, and interested only in low sports, for which he was well supplied with money, his father being a rich brewer who had married Lady Agnes, sister of the penniless Earl of Rosherwood, to one of whose daughters Harry was engaged to be married. He was a kind-hearted young fool, this brewer's son, and found many people to help him in the spending of his money. Pendennis was greatly impressed by the expensive dinner to which he invited him, and gladly accepted his invitation to accompany him to the theatre, where an actress, whose stage name was Fotheringay, was performing. The play was a great experience for Pen. The actress seemed to him a



Pen himself determined to write to his uncle, informing him of his mad intention to marry the actress, with whom he foolishly imagined himself to be in love. It was a frank and manly letter that he wrote, but none the less, as we already know, when old Major Pendennis opened and read it at his club, it threw him into a violent temper, and speedily brought him to Fairoaks.

#### HOW MAJOR PENDENNIS PRESERVED THE "HONOUR OF HIS FAMILY"

The old campaigner did such good service in the sacred cause of his family by talking with so much reason to Captain Costigan and rendering that needy person a little service, that the captain had no difficulty in persuading his daughter to write a brief note to Pendennis releasing him from his promise to marry her, and although the foolish youth talked wildly of dying, he did nothing of the sort.

Pen wrote many more verses full of sadness and sorrow, and after a time decided that he would go to Oxbridge University in order to study for some career, the exact nature of which was not quite clear to him. Harry Foker and other old school-fellows from Greyfriars were there already, reading for their degrees, though there was not the slightest hope of the brewer's son ever passing. So Mrs. Pendennis had to scrape together all her savings in order that Pen might go away well provided.

Once there he conducted himself more like the son of a rich nobleman than a small country squire. In personal appearance and in mental gifts he was probably better fitted to be a nobleman's son than many who were such in reality, and he speedily became the most popular of all the students. Yet he never did what was expected of him.

#### PENNENNIS LIVES LIKE A LORD AT THE UNIVERSITY AND GETS INTO DEBT

All the prizes, which, it was thought, he had only to try for in order to win, were carried off by others, and the brilliant Pen contrived to do nothing more original than run deeply into debt. Every penny his mother could find for him was spent, and at the end of two years, when he had failed in his examinations and found himself seven hundred pounds in debt, he fled from Oxbridge to London, where his uncle, who had been mightily pleased to hear

of Pen's lordly acquaintances at the university, gave him the cold shoulder on learning of the scrape he had got into.

Thus turned away by the major, who was ready enough to help when the "honour of his family" was at stake, but, desperately poor himself, could take no interest in his nephew's money troubles, poor Pen behaved as many another prodigal son had done before, and, writing to his mother, announced that he was coming home to throw himself upon her kindness, which he had so grossly abused. Mrs. Pendennis, gentle soul, was full of forgiveness for her boy, and there was another who shared with her the determination to help the foolish young man out of his scrape.

"You know, mamma," said Laura, "that I have been living with you for ten years, during which time you have never taken any of my money, and have been treating me just as if I was a charity girl. This obligation has offended me very much, because I am proud, and do not like to be beholden to people."

#### HOW ARTHUR'S ADOPTED SISTER THOUGHT OF A WAY TO PAY HIS DEBTS

"Now, if I had gone to school—only I wouldn't—it must have cost me at least fifty pounds a year, it is therefore clear that I owe you fifty times ten pounds, which doesn't belong to me a bit. Now, to-morrow we will go to Chatteris, and see that nice old Mr. Rowdy, with the bald head, and ask him for it—not for his head, but for the five hundred pounds, and I dare say he will lend you two more, which we will save and pay back, and we will send the money to Pen, who can pay all his debts without hurting anybody, and then we will live happily ever after."

Thanks to this little plan of Laura's, Pen's debts were paid, and although he had to observe many little economies in his life at Fairoaks, and had to see his devoted mother and Laura stint themselves for his sake, he could think of nothing better to do than the writing of gloomy poetry. It was due to Laura that at length he determined to return to the university, where, behaving very differently, and applying himself to his studies, he took his degree without difficulty, and again came back to his aimless and despondent life of idleness at Fairoaks.



An event of some importance in the history of Arthur Pendennis now happened. Clavering Park, the great mansion of the countryside was to be reopened and after many years a Clavering was to be in residence there again. Sir Francis Clavering was a person of very doubtful reputation and had at one time been an inmate of the debtors prison before he went abroad to make a living by means best known to himself. Luckily for him he had married in Calcutta the daughter of a wealthy indigo planter named Snell and came into possession with her of a large fortune. She was understood to be the widow of a ship's officer named Amory, who had mysteriously disappeared and she had one daughter, Blanche. The fact that the Snell fortune had been made in doubtful ways did not trouble Sir Francis Clavering. He was very glad to find in Mrs Amory a wife who was as good natured as he was vulgar and whose great wealth was at his service.

#### PENNIS SLIPS AT FAIROAKS AFTER HIS RETURN FROM THE UNIVERSITY

It was great news for the district that Clavering Park was once more to awaken into a life of gaiety and activity and Pendennis was not the least of those interested in the prospect of some new excitement in the dull and purposeless life he was living. His little estate adjoining the great one meant that Fairbairns would to some extent share in the revival of Clavering Park.

Nor was he at first immune to the charms of Miss Blanche Amory, the daughter of Lady Clavering. This young lady, very fair and pleasant to look upon, had a romantic turn of mind which led her to poetry of much the same character as had afflicted Saltnest was the keynote of their thoughts, although neither had any reason for sadness except the wish to appear romantic after the style of Lord Byron.

Then took to him, on the river, and Blanche also discovered a new interest in walking there. They exchanged their salubrious views and thus was a strange partnership that rivaled a most romantic post-graduate, while they could give their friends a better story. But when in the course of time the great fair was to be opened, who at first had seemed to be in the

Claverings began to show friendliness to Sir Francis and his family, thanks to the wealth of the widow Amory. Miss Blanche curiously lost her taste for these romantic little walks and the delights of the hollow tree post office.

#### PENNIS GOES TO LONDON TO WORK FOR FAME AND FORTUNE

After a time Arthur Pendennis seemed suddenly to realize that he was still far from doing all that he might to make his mother happy and as he was by no means an undutiful son although he too often did the wrong thing, he now determined that he would do the right by going to London and studying for the Bar. After winning a place for himself in the great city, he would return to fulfil the wish of his mother's heart by marrying Laura.

As Pen had been a spoiled child all his life and had so often found those who loved him ready to make sacrifices on his behalf, he was now not a little surprised and a great deal of indignation Mrs Laura saw fit to reject the noble offer of his hand and he left and when he went to London it was with the feeling that he had been very badly treated. The fact was that the selfishness in his nature had been allowed to grow too strong and he stood very much in need of a whole some lesson in conduct. It was as fortunate for himself as it bitterly was for her that Laura had the good sense to teach him this much needed lesson.

#### PEN WITH HIS FRIEND WARRINGTON AND THEIR LIFE IN THE GREAT CITY

In London Pendennis shared chambers with his old friend George Warrington, a younger son of Sir Miles Warrington. George was one who with no fortune had a strong character. Although in many ways and at least a gentleman, he had been so disciplined by a stern woman who was unfit to be his wife and as a consequence he had dropped out of the social world in which he should have lived and been left down at heel and therefore he lived a very wretched life in outward contrast with his real awakened nobleness. A strong, sturdy, earnest character, a strong, sturdy, earnest character from the end of the day.

Then will not have a better company than that of Warrington who had at the same time the same and a good deal more to say to his friends. Then was a day when

for, despite all his good resolutions, Pen was very soon neglecting his studies and giving himself up to lazy and thriftless habits. His money came to an end too soon for his liking, and it was then that Warrington turned upon him and pointed out the meanness of Pen's life, so much of which had been spent in sponging off his mother, and even accepting the assistance of Laura

#### PENDENNIS DREAMS OF BECOMING A GREAT POET LIKE LORD BYRON

But Warrington did better than this. He suggested to the erratic youth an honourable way of earning money. Himself he was writing for the papers, and so avoiding the need to borrow from friends. Why should not Pendennis do the same, and better? For there was no doubt that he had considerable literary talents. So Pen would be a poet for pay, and earn great sums of money, as Lord Byron had done before him! Warrington laughed at the absurd enthusiasm of Pen, and induced him to fly at smaller game, with the result that the young Squire of Fair Oaks was presently making his way as a contributor to the newspapers and magazines, bidding fair to be a successful journalist. Soon he began to consider himself an extremely noble young man indeed, when he was able to send small sums of money to his mother, though these were but very tiny instalments of the debts he owed to her and Laura.

Occasional meetings with Captain Costigan, who was now in London, where his daughter had married an elderly baronet, and who still retailed his fictitious stories to admiring groups of young men, awakened memories of Pen's earlier follies.

#### PEN BEGINS TO WIN FAME AS AN AUTHOR AND JOURNALIST

But, although he was not above spending his evenings in the taverns where Costigan and his cronies gathered, he still maintained the grand manner and noble bearing he was supposed to have inherited from his long line of ancestors, much to the amusement of Warrington, whose ancestors, as we know from "The Virginians," had been really distinguished.

Yet Pen held on his course in the new work he had found, and as a journalist and author he began to prosper. A novel which he wrote made his name

known, and even the old major, scenting the possibility of fame for his nephew, began to revive his interests in the honour of the Pendennis family.

Just at this time Pendennis was stricken with fever, and was lying in a very serious condition at his rooms in the Temple, where poor little Fanny Bolton, the pretty daughter of a Temple porter, had come to nurse him. As soon as the news reached the major, he arrived with all haste at the bedside of the invalid, and there met Mrs. Pendennis and Laura, who behaved none too well to poor Fanny. George Warrington had gone away from town before Pen took ill, and was therefore absent when Major Pendennis and the others came to the rooms he shared with Arthur, but he returned to find the ladies in possession, and to discover in his heart a deep and true affection for the gentle Laura Pell.

#### PENDENNIS RECOVERS FROM THE FEVER AND LOSES HIS DEVOTED MOTHER

It was a wonder to him how Pendennis could ever have been insensible to the personal charms and beautiful character of that young lady, for whom he himself would willingly have given the whole world. And Laura on her part recognised at once the true gentlemanliness of Warrington, admiring the strength and independence of his character, and contrasting him with Pen and his dandyism, by no means favourably to poor Pen.

When Pen recovered from his fever, instead of striving to please his devoted mother, who had wept over him and borne with him so long, he acted with his old foolishness by declaring that Helen and Laura had done a great wrong to Fanny Bolton in turning her away from her nursing duties at his bedside, and that he meant to marry the porter's daughter. This was a return to the old stupid Pen, who had thought himself in love with the actress and ready to die for her. The major, of course, was frantic at this new whim, and Mrs. Pendennis was prostrated with grief and weakness; but not until George Warrington had told him of his own unhappy married life, and warned him against the danger of offending those who loved him best, did Pen regain his sober mind and go to his mother subdued. It was almost too late, for

## PEN SURPRISES HIS UNCLE, THE MAJOR



Trading on a secret Major Pendennis had got Sir Francis Clavering to resign his seat in parliament to Arthur Pendennis, and to promise a fortune to him if he married his stepdaughter. On getting to know the secret Pendennis was indignant and exposed his uncle's baseness. "I'll keep my promise to Miss Amory," said Arthur, "but I will let Clavering off from that bargain that was made without my knowledge. I will let him on money with Blanche but that which was originally settled upon her, and I will try to make her happy."

Mrs. Pendennis who had been suffering in silence died as she kissed her son to whom her whole life had been devoted.

After the death of his mother Arthur Pendennis was greatly changed though he was still far from having reached true wisdom. As soon as the period of mourning was over the major more anxious than ever to maintain the honour of the Pendennises set about discovering a rich wife for Pen while Laura now went to live with Lady Rockminster who had the good sense to understand and appreciate the sterling character of that little girl.

In the course of his explorations among the rich and titled families of the day, old Major Pendennis found himself a guest at the town house of Sir Francis Clavering, when an extraordinary secret took place. A stranger person in a tipsy state forced himself into the room as dinner was in progress and created a great disturbance. The stranger was known to some of the party as Lord

Altamont, an adventurer from India, but when his eye caught sight of Major Pendennis he suddenly reeled towards the door and was heard to mutter as he fled the name "Captain Black, Captain Black. By Jingo!"

Sir Francis had shown the greatest fear and trembling when this utterly stranger appeared upon the scene and it so happened that the old major recognised in a flash who this Lord Altamont was. He had seen him before as one of a company in New South Wales, and had good reason to believe he was no other than Arthur, the scoundrel who had ruined the present Lady Clavering's marriage. When she was Miss Susan, it was the fact, and Altamont had been paying up his debts by selling her as a match that person supplied with money to her to keep quiet.

Both Sir Francis and Altamont were men of a character as to which it was none the less particular for a gentleman.

while caring for neither, determined to make some use of this knowledge he happened to possess. So he made a proposal to Sir Francis Clavering

# HOW MAJOR PENDENNIS TRIED TO PROFIT BY A SECRET

"I want my nephew to enter public life," he said. "I want him to marry Miss Amory, and I want you to resign your seat in parliament in his favour. Nobody need know anything more about it." And thus we see that in his ambition to have a Pendennis eminent in the public life of his country he did not scruple at driving a bargain with a rascal in a corner.

"It will be easy enough to get rid of Amory," the old warrior thought to himself. "I could put my hand on witnesses who can swear to him, and who will prove that he killed one of his guards in New South Wales. Let my boy marry the heiress, and the rest will be easily done." The fact that his boy would thus become the husband of one whose father was a criminal did not seem to disturb the old schemer.

So it came about that in a few days more the major was able to apprise his nephew of the good fortune that had opened up for him. For it was before the days of honest voting for members of parliament, and people of wealth and position could do pretty much what they liked in obtaining admission to the House. Pen, of course, had no idea of the means whereby Sir Francis resigned his seat to him, and accepted it naturally as a reward for his own great abilities, which he esteemed, perhaps, more than did the world at large.

## THE MAJOR THINKS HIS LITTLE SCHEME IN FAVOUR OF PEN IS SUCCEEDING

Pen did not take his uncle quite seriously when he suggested that Pen should become the husband of Miss Blanche Amory; but none the less he presently found himself a favoured guest of the Claverings, and the old days of exchanging poetry and romantic walks together had come back again, with this difference, however, that Arthur now had the encouragement of Lady Clavering and Sir Francis, and, better still, the rivalry of his old friend, Harry Foker, who, in his simple, stupid way, had fallen in love with Blanche

Before long, indeed, the major had the delight of knowing that his nephew was engaged to Miss Amory, and the worldly old fellow rubbed his hands with pleasure as he watched the success of his plans. Unhappily for the major, he had reckoned without allowance for the erratic character of his nephew, in whom the impulse to do the straightforward and honourable action was often stronger than the readiness to take a mean course, though his intentions were sometimes better than his deeds.

Judge, then, the consternation of Major Pendennis when his nephew discovered, thanks to the eavesdropping of the major's valet, Morgan, who was base enough to betray the secrets of his master, the real reason for Sir Francis Clavering retiring from parliament in favour of Arthur Pendennis. The major had suffered many shocks and surprises due to the conduct of his nephew, but all were eclipsed by the shock he received when one day Pen burst into his room indignantly and rated him soundly for the mean compact he had made with the baronet.

## PENDENNIS REFUSES TO DO A BASE THING AND RUINS THE MAJOR'S PLANS

"Can't you see, sir," cried Arthur "that rather than profit by this secret I would go and join my prospective father-in-law in the hulks? Can't you see that you have given me a felon's daughter for a wife, and doomed me to poverty and shame?"

"What, in the name of wonder, can you mean, sir?" asked the major, in a voice that betrayed his pain and alarm.

"I mean to say that there is a measure of baseness which I can't pass," Arthur answered. "I have no other words for it, and I am sorry if they hurt you. I have felt, for months past that my conduct in this affair has been wicked, sordid, and worldly. I am rightly punished by the event, and having sold myself for money and a seat in parliament by losing both."

"How do you mean that you lose either?" shrieked the old gentleman. "Who is to take your fortune or your seat away from you? Clavering shall give it to you; you shall have every shilling of eighty thousand pounds."

"I'll keep my promise to Miss Amory, sir," said Arthur, "but I

will let Clavering off from that bargain that was made without my knowledge. I will take no money with Blanche but that which was originally settled upon her and I will try to make her happy. You have done it. You have brought this upon me sir. But you knew no better and I forgive—

It was in vain that the old man begged of Arthur who was now feeling tremendously virtuous and noble, to take a more worldly view of the situation. He even went down on his knees to him which was an extraordinary effort for the proud old major but he was desperate at seeing his cherished scheme thus fail to carry. Arthur was determined to do the honourable thing at last as indeed at all times his better nature prompted him to do. He would not accept the seat in parliament on the conditions his uncle had arranged but he would stand by his promise to Miss Amory if she wished it.

#### IN THE CRISIS OF HIS LIFE PEN DENNIS TAKES ADVICE FROM LAURA

In this crisis of his life he fortunately followed the best promptings of his heart by going to Laura and seeking from her whose gentle nature and calm clear understanding could give him the counsel and comfort he most needed. In the presence of Laura he discovered at last that he did not love Blanche.

He had known before that when it would have suited his purpose to marry her he had shut his eyes to her faults. Now that he contrasted her with the faithful unflinching Laura to whom he owed so much he saw only too clearly how vain and heartless was Amory's daughter and how her pretended romantic interests were a mere cloak for a shallow and selfish character.

Though Laura urged him to keep his word to Mr. Amory and to see no more in telling that young lady he was prepared to carry out his promise, we may have reason to think he was not without hope that Blanche herself might settle the matter differently to Laura had now or no back to something of her old English admiration for the old Pendennis and who can tell what her hopes were at this crisis of his fortune?

Events soon happened that decided the lives of many with whose future we have been concerned. The sudden

death of the wealthy brewer Foker and young Harry falling heir to £12,000 a year had a great effect upon the romantic heart of Miss Blanche Amory who had no hesitation in giving Pendennis his dismissal when he placed himself in her hands. She was now to become the wife of the wealthy young brewer and great were the preparations at Clavering Park for her wedding.

#### BLANCHE AMORY LOSES A HUSBAND BY ACTING DISHONESTLY

Just then Pendennis discovered that Blanche's disreputable father the ex-convict was hanging about the neighbourhood, evidently bent on blackmail. Telling her of this he urged her to let her future husband into her secret but afraid of losing Harry Foker and his fortune Blanche thought it better to keep the matter quiet until he had been married. Unfortunately for her she could not keep her drunken parent quiet and that person getting into a scrape the news reached Foker who suspecting that Blanche had known the secret all along and kept it from him flew into a righteous rage and before himself far from Clavering Park.

I would have taken you whatever you were he said in his last meeting with Blanche. I have loved you with all my heart and soul. But to think that you have been playing with me and cheating me!

And so it happened that instead of a brilliant and fashionable wedding at Clavering Church a very unceremonious was there observed one day the bride and bridegroom being—Miss Laura Bell and Mr. Arthur Pendennis.

#### ARTHUR PENDENNIS AS A HUSBAND AND A FATHER

And what sort of a husband and a father this Pendennis be? many a reader will ask himself the day, musing on such a marriage and the future of Laura. The question if they meet let, are referred to that lady herself who seeing his faults and wayward mood scowls and wonders that there are men better than he loves her always with the most constant attention. He cherishes her rather less than he does a bar of soap or a new pair of shoes and when he comes to see her he always comes with a letter from her and an old maid.

The next day we see him at the gate of Clavering Park.

# WILLIAM CAREY WORKING AS A COBBLER



William Carey, "the father of modern missions," was a shoemaker by trade, but although poor, he educated himself, and became a Baptist minister. Even then he had to make and mend shoes for a living, as shown in this picture, for his congregation was composed of people so poor that they were able to give him only six shillings a week as salary. Carey not only inspired earnest Christian men with his own enthusiasm for teaching the Gospel to the heathen, but he won the esteem of the most distinguished men. After he became great and famous, he was once dining with the Governor-General of India, when a conceited youth at the table, pointing to Carey, said insolently to his neighbour "This fellow was a common shoemaker, was he not?" Carey overheard the question, and he replied in the most gracious tone "No, sir, not a shoemaker, only a poor cobbler."

# The Child's Book of MEN & WOMEN



## SOME FAMOUS MISSIONARIES

There are many battles where no gun is fired and real heroes who wear no red coats for peace as Lord Tennyson sang has her victories no less renowned than War. Among the world's great heroes stand out the names of many brave men and women who have gone out to teach the Bible to peoples of distant land and to carry the blessings of Christianity into uncivilized countries.

The missionary who fulfils the command of Jesus to His disciples

Go ye into all the world and preach the Gospel to every creature, their fully lives his native land his home and his friends to spend his life where there is no civilisation no comfort or safety to dwell with dark-skinned men who worship ugly idols and are given to superstitions and cruel practices. The climate is often deadly and his health breaks down where no doctor can advise or help. He has to endure hard ups and sufferings and the work of years seems in a moment almost hopeless until he has a thousand acres of the natives.

To this unglorified service some of the best service is from our countrymen gladly give themselves but we shall see how many of the best men and women have been paid.



boys who have taught themselves and have had to overcome many difficulties in their early days. They have made all the better missionaries for this for in their work abroad they have been able to build their own

houses and to teach their converts how to cultivate the land and to do other useful work. Of course they have had to learn the language and after that have often done good service in translating the Scriptures and many of our well known hymns into the native tongues. The missionary is the pioneer—the first in the field. He makes it possible for trade to follow in his steps for the natives will believe in the white men who come in business because they respect and trust him who has been their old friend and taught them to live right.

Let us look at some of these brave missionaries, whose names have become household words all over the world.

The Maristars are the pioneers of modern missionary enterprise. Although they are a very small body they have had more than 1000 names in the 19th century of the world and the past 100 years are the like of them as the world has been able to give them a name.

## THE CHILD'S BOOK OF MEN AND WOMEN

Moravian Brethren, who sailed from Bergen in Norway, in the year 1718, to live among the Eskimos in the frozen North. He landed on the inhospitable shores of Greenland, and soon found how difficult it was to teach people so gloomy and superstitious, and for years he had to endure great hardships with little encouragement.

But he held on, and at one time, when the Eskimos were plague-smitten, he made his house their hospital, and tenderly nursed them, an act of mercy that won their gratitude. Egede was a man of simple faith, and with great humility did his work at a time when there were few missionaries anywhere, and none at all in the Arctic regions. As quite an aged man he returned home to Copenhagen, bringing his wife's remains for burial among her own people, and on November 7, 1758, he, too, entered into his rest.

**DAVID BRAINERD, WHO LEFT ALL TO GO AND PREACH TO THE RED INDIANS**

Another early missionary was David Brainerd, a Yale student who preached to the North American Indians in the colonies of New England. Brainerd was born so long ago as 1718, and his parents dying while he was yet a boy, he began life an orphan and with delicate health. As he grew up, he took to farming, and used to walk his fields bewailing his sins, for he was of a serious turn of mind, and full of self-condemnation. He was treated harshly at Yale College, although there is no name on its roll of greater honour, and he resolved to take the Gospel to the Red Indians, who were then, of course, very much more numerous than they are now.

The hardships of travel, the sleeping in the open air, and the scanty food, soon began to tell upon his weak constitution. The language, too, was difficult, and he had to work very patiently at it, riding twenty miles through the dark forests to his instructor, and an offer of a comfortable pastorate among his own people was refused with self-denial. The story of his work among the Indians is one of truest heroism, for he had to work for many years without a glimpse of success. At last the revival came, thousands of the men of the forests came flocking to Brainerd, asking for

prayer and counsel, and the heart of this humble servant of God was filled with gratitude. He was an old-fashioned saint, and his journals are a treasure of sweet musings that are read to-day.

**CAREY THE COBBLER, WHO BECAME THE FATHER OF MODERN MISSIONS**

But it is to William Carey, the learned cobbler who translated the Scriptures into Bengali, that we owe the organisation of missionary work and enterprise in the churches of our English-speaking lands. When the popular idea, and even the belief of clergymen and ministers, was that if God wanted the heathen to be Christians He would convert them in some miraculous way Himself, Carey taught the great truth that it was the duty of Christian men in England and other lands where the Gospel was known and loved to carry out the Divine commission and go and preach to others.

Carey was a country boy, born in the village of Paulerspury, near Northampton, and his father, being parish clerk and schoolmaster, taught his son so well that his mother used to hear him counting in his sleep. William liked books, and was also fond of gardening. Picking up a little Greek and Latin while working as a shoemaker, he became a Baptist minister on £16 a year, and to add to his income still made and mended shoes, and did a little teaching.

One of the outstanding events in modern missionary history is the famous sermon preached by Carey at a meeting of ministers at Nottingham, in June, 1792, that led to the formation of the Baptist Missionary Society, the first organisation of its kind. The text was Isaiah liv. 2-3, and the preacher divided his sermon under two heads: "Expect great things from God," "Attempt great things for God," words that afterwards became the motto of the society.

**A FAMOUS SERMON THAT STARTED THE GREAT WORK OF FOREIGN MISSIONS**

The sermon created a profound impression, and the ministers decided there and then that by their next meeting, which was to be at Kettering, in the same year, a plan for the formation of a missionary society should be prepared and this was done.

Then came his call to India as a missionary for Bengal, but he had difficulty in getting there because of the opposition of officials. Arrived at



### SOME FAMOUS MISSIONARIES

Calcutta Carey found himself and family homeless, friendless and with scarcely any money. He tried to earn something by planting indigo and at once gave himself up to the translation of the New Testament into Bengali and became so proficient in that language that he was appointed one of the tutors in Fort William College. Through his efforts joined with those of other missionaries the government passed a law forbidding the burning of widows and during his forty years of splendid Christian labour he earned the position of distinction which he holds in the history of missionary enterprise. A domed tomb of solid stone in the cemetery at Calcutta

mission field. While at the university he became fast friends with another deeply religious student Henry Kirke White the Nottingham poet. After his father's death Martyn had to make some provision for his sisters so he went out to India as a chaplain under the Board of the East India Company. On the voyage out he preached to the crew and spent much time in learning Hindustani. After a short stay at the Cape he reached Madras on April 22, 1806.

In his Indian work he met with great opposition not so much from the natives as from the English officials, civil and military, but he persistently laboured on translating the Bible with his



When Henry Martyn was missionary in Persia he said of the Virgin Mary and of the place where she was born: "It was with the greatest difficulty that he [Jesus] came and that he was able to go to the street in which we were at on his final exhalation of the Holy Spirit." (The New Testament of the Holy Spirit, 1848, p. 100)

marks his resting place the only inscription at his own request being his name and the date with the words

A wretched poor and helpless woman  
On Thy kindness I fall

Another noted missionary to the people of India was Henry Martyn the Cambridge student, who travelled also in Persia. He was a Cornish boy of Truro but was so weak in body that it seemed impossible that he would make any mark in the world, or live to tell himself famous. But at St. John's College, Cambridge, he showed great aptitude for study, and it was during a vacation spent in Wales that he first responded to the call to enter the

faithful moonshine or teach a husband  
He also turned his eyes toward Persia  
and with great pains at last at sea  
ship translated the New Testament into  
Pers in traveling in that country if it  
he might get to know and thereby  
understand the people

The Michigan has forever faded from the life of that hardy pioneer fisherman to trade with a respect. Finally in a time of gladness he passed away at Detroit in October 1926. On the 10th of May walked not far from the river's side. Had Michigan and her fishery left and he counted as one of the nation's fisherman.

Robert Morrison, like Carey, was a shoemaker, and it was he who translated the Bible into Chinese. It often happens that a missionary has one part of the world in his mind and yet goes to another. Livingstone's original intention was to go to China, but he went to Africa. So Morrison, who meant to follow Mungo Park to Timbuctoo, found his real sphere in China.

**ROBERT MORRISON, WHO GAVE THE CHINESE PEOPLE THE BIBLE**

As a youth he learnt his father's trade at Moipeth, but, before going abroad, he not only became a medical student at St Bartholomew's Hospital, but found a young Chinaman in London, who taught him his language, and also showed him the sort of people to whom he was going to preach across the distant sea.

Arriving there, he let his hair grow, and wore a pigtail, and tried to live like a Chinaman until his health failed. His great work was the translation of the Bible, but he also gave the English Prayer-book to these people in their own tongue. But he was of great service to the English government in difficulties which arose with the Chinese, and at one time he was the secretary and interpreter of the consul. Before he died, in 1834, Morrison had finished his great dictionary of the Chinese language in six quarto volumes. To-day, all the Christian workers and their converts in China read the Bible he left behind.

John Williams, known everywhere as "the Martyr of Erromanga," was a young blacksmith. It was in City Road, London, that he swung the hammer at the forge. One Sunday night in 1814 a good old woman took him to the Moorfields Tabernacle, which led to his conversion, and to his future career as a missionary.

**THE MARTYR OF ERROMANGA, WHO BUILT A HOUSE AND A SHIP WITHOUT TOOLS**

He had little education, but was quick-witted, and impressed people with his honesty; he had also the knack of sticking to a thing, otherwise he would never have mastered the language of Tahiti, in the Society Islands, where he first went to preach the Gospel. He taught the natives some valuable lessons in handicraft, as they watched him build first his house, and afterwards his mission ship, the *Messenger of*

Peace, with scarcely any tools. Perhaps the most difficult task was to make a pair of smith's bellows of goat skins, which the rats ate before morning.

In his boat, with mat sails, he made dangerous voyages from time to time, thousands of natives, who loved him, bidding him farewell with songs of sorrow. Six times Williams was nearly drowned, the sea waves dashing his vessel on the rocks. He was spared, however, to evangelise these South Sea Islands, and translated the New Testament into Raratongan. He came home, after many years, to plead the cause of these poor people in England. Returning on November 20, 1839, he landed with three companions on the shore at Erromanga. But the natives were hostile. A big savage struck Williams on the head, killing him, and a shower of arrows followed. In a few moments "the rippling water was red with the blood of the noblest man that has ever gone to those far-off isles of the South Sea, laden with blessings for the ignorant and outcast."

**THE SAILOR WHO CARRIED THE GOSPEL TO THE END OF THE WORLD**

When George III. was king, young Allen Gardiner, the middy who took Christianity to the wild Patagonians, had his first taste of the sea in wartime. Later, he bought a Bible at a second-hand shop, the reading of which changed his whole life, and he went out to Africa, after many dangerous adventures, preaching the Gospel to Dingan, the Zulu chief, over whom he exerted a good influence. After a time he sailed for Brazil—for South America was in great need of the Gospel—and earnestly worked among the Indians of Chili. Several times he nearly lost his life, but, nothing daunted, he resolved to visit Tierra del Fuego, and landed among the Patagonians with a few brave companions. He found these people very degraded, as Darwin had described them, but, with infinite patience and faith, Gardiner tried to bring light to their dark hearts. The closing days of this brave life were very pathetic. Landing at a certain point, he and his helpers found themselves without food. John Pearce, one of the number, crawled along the beach to say that Joseph Erwin had not spoken for two days, and when Gardiner, after a painful struggle,

## THE PERILS OF THE MISSIONARY'S LIFE



Over and over again, Dr. P. Lee, the missionary to the New Hebrides, had to rush into the arms of some savage who was about to kill him with his club, and lag round the man until his wrath abated.



It was Egri, who carried the Gospel to the Eskimos, who walked about Bertha for nearly 60 years before he could persuade a young man to join him to General Ad. He was returning home with his departing ship.



It is no harder story in missionary history than that of Captain Adams (Adams) who was present at the capture of the pirate ship, the *Amelia*, and his party bound the pirate ship. One of the crew, the *Amelia*, was killed, and the *Amelia* was destroyed. Captain Adams was killed by the side of his boat, where his body was found by those who came to his aid.

reached the place, Erwin lay stiff and cold. Still another, John Bryant, was found cold and dead, with a smile upon his face, not far away.

# THE BRAVE MEN WHO WAITED FOR THE HELP THAT NEVER CAME

Thus died they all, waiting for the help that never came. A month afterwards an English ship anchored by the still shores of Tierra del Fuego. All was silent in that dreary region. Along the beach the faithful martyrs lay. The captain cried like a child at the awful sight.

Gardiner had fallen down by the boat, too weak to climb back again, and scattered on the beach were the papers on which he had written in pencil the story of their sufferings. Written on the rocks were the words "My soul, wait thou only upon God, for my expectation is from Him," painted there by Allen Gardiner as he lay, racked with pain, waiting for death.

Robert Moffat was a young gardener, and he became the pioneer missionary of South Africa. He was born at Ormiston, in East Lothian, on the shortest day of 1795, and his early days were divided between his Latin grammar, the blacksmith's hammer, and his violin. Afterwards he became an under-gardener in Cheshire. Seeing a placard of a missionary meeting, he attended, and thus so influenced him that, after much prayer, he offered himself as a missionary.

He sailed for the Cape on September 18, 1816, and his first work, having learned Dutch, was with the farmers and the poor Hottentots, who were little better than their slaves. He visited Africander, "the Bonaparte of South Africa," and greatly influenced him for good, bringing him down to Cape Town, to the astonishment of the Dutch. He then founded the mission stations in Namaqualand, and worked among the Bechuanas at Lattakoo.

## HOW ROBERT MOFFAT CAME TO LONDON AND PREACHED IN THE ABBEY

He translated part of the New Testament into the Bechuana language, and returning for a visit to England in 1840, he was able to translate some of the Old Testament, including the Psalms. In the year 1873, as a tall, white-bearded old man, he was invited by Dean Stanley to speak at Westminster Abbey, and a great crowd listened with

reverence to his thrilling story of work among the natives of South Africa.

His later work was at Kuruman, where his daughter married Livingstone, and at last, with his faithful wife, he returned home, and died full of years and public honours in August, 1883, the veteran apostle of the mission field.

We read about David Livingstone, the Scottish weaver boy, whose heart was buried in Africa, on page 144. We are not likely to forget his honoured name, and on the floor of Westminster Abbey, where the sunshine falls through the stained windows, we find his grave, but his heart is buried in the land he loved so well.

We read of Bishop Crowther, the black slave boy who became a bishop, on page 2914 of this book. There have been few histories of the mission field equal in interest to the life of this black bishop. He was a marvellous example of what a negro may be and do in the service of God and man.

## A SCHOOL FRIEND OF MR. GLADSTONE WHO BECAME A MISSIONARY BISHOP

Bishop Selwyn, the athletic student who worked so hard in New Zealand, was born in an old-fashioned rectory at Hampstead on April 5, 1809. After some preparatory schooling at Ealing, the boy, who, one day, was to be a bishop, was sent to Eton, where he made friends with many who, like himself, became in later years great men. His school chum was Mr. Gladstone, and that friendship remained till the very last. Here, and afterwards at the university, Selwyn was first in all the sports. It was said of his good nature that "he always took the labouring oar in everything." He could drive like none other, and in the grounds was "Selwyn's bush," over which he leapt and turned a somersault into the river on the other side. In due time he became a curate at Windsor, and was consecrated Bishop of New Zealand on October 17, 1841.

The Maoris were not yet settled to English rule, and in the conflicts that often occurred the personal influence of Bishop Selwyn counted for much. The Maoris trusted him, and he was peace-maker often at great risk to himself. "I am your mediator," he used to say to them. "I have eaten your food, slept in your houses, talked with you,

prayed with you let us dwell together with one faith one love and one Lord. He travelled through the country and once after visiting an island he brought two little girls back with him arrayed in garments made by himself out of an old quilt.

#### BISHOP SELWEN'S DEATH AND HIS INFLUENCE OVER AN ETON BOY

Afterwards he came home and became Bishop of Lichfield where he worked hard and at last on April 11 1878 lay a dying. Calling some children to his bedside he said softly "I wish you were little robins so that you might sit on my finger." Soon afterwards he whispered in the Maori language.

It is light and smiling passed to the land of everlasting day.

Bishop Patteson the Eton boy who was martyred in Melanesia was a Devonshire lad fond of books and of a good game of cricket. Young Patteson went from Ottery St Mary to Balliol College Oxford where he studied hard and was played as captain of the eleven. A long holiday spent in travelling on the Continent opened his mind but it was hearing a sermon by Bishop Selwen in the parish church of New Windsor that inspired him with the desire to be a missionary and eventually as a young clergyman the bishop took him with him to work among the islands of Melanesia. Here for years he laboured preaching the Gospel and specially caring for the native lads whom he loved and trained as teachers on Norfolk Island. A man of great courage Patteson used to visit the islands sometimes swimming through the surf often at great personal risk.

#### HOW THE CANNIBALS OF MELANESIA KILLED THEIR BLISSFUL FRIEND

He tried to protect the natives from being kidnapped by white men but one day when he had landed alone among a crowd of infuriated cannibals he was killed and his body with five wounds and five scores of pains upon his back was floated out to the ship. A beautifully carved pulpit to his memory stands in Peter Cathedral.

Another bishop Dr Steere known as the fisherman is famous, went to Zanzibar. For many years the slave market of East Africa was at Zanzibar and Bishop Teate had driven to convert the people who became idol hands from

the sultan. Now upon this spot where miserable people were sold into slavery a handsome church with a high steeple stands the cathedral of Zanzibar which was built by Bishop Steere. He succeeded to the bishopric when Bishop Tozer resigned and had come out from England where he had worked among the poor. He was rector of Little Steeping near Skegness and the fisherman of his parish called him a downright shirt sleeve man and a real Bishop parson.

He first went to Zanzibar in 1862 and after translating part of the Scriptures into Swahili returned home and returned again as Bishop of Central Africa having been consecrated in Westminster Abbey in 1874. He spoke many languages—French German Portuguese Italian Spanish besides the native dialects. On August 28 1882 he was buried in his cathedral church at Zanzibar.

#### THE BRAVE BISHOP HANNINGTON WHO DIED A MARTYR IN UGANDA

Bishop Hannington the merry school boy who died for the faith in Africa was such a cheerful youth that they called him Mad Jim at school and all through his life this happy heartedness never left him. He had a pleasant curacy in Devonshire and then went to Hursley point in Sussex where though married and settled with his family around him the call of God came to Hannington to go to Africa a missionary. He landed at Zanzibar in 1882 and travelled up the country through dense forests perils by robbers and wild animals and eventually reached Lake Nyanza where Stanley had said goodbye to Livingstone some years before. Whatever he met the chiefs he preached to them of Christ and after teaching the natives at Nyanza Lake he turned home again and was in England again after a year's absence. But in 1884 he went out again to Equatorial Africa landed at Uganda was captured by a native chief and after declaring to the natives that he was ready to die for Uganda was shot with his own gun.

Another devoted missionary who died at the post of duty in Uganda was a young engineer named Alex. C. Mackay. He was never any other than plain Mr. Mackay a very unassuming and quiet and a big-hearted man and a brave man.

a Free Church manse, he studied hard for his profession, both in Edinburgh and Berlin, reading also good books, but never neglecting the Bible his mother gave him when he left home

**THE ENGINEER WHO BECAME A MISSIONARY AND WOULD NOT COME HOME**

He was always a strong character, and when he was in Uganda, faced by worries and persecutions enough to daunt anybody, his spirit was undimmed. He passed through the terrible experiences of those early years when he had to fight not only "the heathen in his blindness," but the Moslem and Roman Catholic factions which strove for conquest

Mackay told his wonderful story in his letters home, never making much of his part of it, though he was really the hero of many a struggle. He wrote articles trying to open the eyes of his friends in England to the real needs and troubles of Africa, all the while he was working away at practical things, with his heart full of the love of God. Mackay always thought of himself last. In one of his letters he said "But what is this you write—'Come home'? Surely, now, in our terrible dearth of workers, it is not the time for any of us to desert his post." Mackay died of fever on the morning of February 8, 1890, still young in years, but in Christian service almost a veteran.

James Chalmers is often spoken of as Tamate, the name by which he was known in New Guinea. When he first landed, a native called out "What fellow name belong you?" "Chalmers," was the answer. "Tamate, Tamate," the native shouted as he ran back to his companions. This is how he came to go to New Guinea. His father, who gave him sixpence for learning the 23rd Psalm, was a stonemason in Ayrshire, and sent the boy to Sunday-school, where he heard from his teachers of the need of help in Fiji.

**HOW JAMES CHALMERS WAS KILLED WHILE TRYING TO MAKE PEACE**

Coming home he determined to answer the appeal. From that time his face was turned towards the mission field. After going to Cheshunt College he was ordained at East Finchley, and in due time started for Samoa and Raratonga, in the Pacific. He took with him a good, brave wife, who shared his trials

His work among the cannibals in these islands was rendered more difficult by the strong drink they took, that Europeans brought to them. But he loved the savages, though he often stood in great peril when dealing with strange chiefs, who tried to rob him and threatened his life with their clubs and spears. But Tamate, unarmed, defied them, and lived to be a white-haired old man. Then, one day, hearing of trouble among the natives on Goaribar Island, he went up the Fly River, and, in his fearless way, walked among them, seeking to make them quiet and peaceful, but they knocked him down and speared him, and afterwards feasted upon his body.

John G. Paton, a Dumfries laddie, became the Apostle of the New Hebrides. He won this title of honour by living among the natives of these islands until his hair was white, gaining their love by his patience and helpfulness, and teaching them how the grace of God could make the very worst of men good.

**THE RAIN THAT CAME UP FROM A HOLE IN THE EARTH**

He left Glasgow as a young man, and the chief of the Island of Tanna told him the fever would soon kill him, but his life was mercifully spared not only from disease, but from the clubs of these cannibals; for he was not afraid to stand between quarrelling tribes, and on one occasion his house, with all his books and medicines, was burnt to the ground.

Paton believed in prayer, and one of the wonderful stories he used to tell was how, when all the natives were suffering from drought, he dug a well in sight of them all, asking God to send water. The people had never heard of such a thing, and one chief said to Paton:

"No, missi, you will never see rain coming up from the earth on this island. We wonder what is to be the end of this mad work of yours. We expect daily, if you reach water, to see you drop through into the sea, and the sharks will eat you! That will be the end; death to you, and danger to us all!"

When at last the water came in refreshing springs, the people brought their idols and burned them, promising to worship only the one true God.

The next Men and Women begin on 3567

# The Child's Book of Its Own Life

## WHAT THIS STORY TELLS US

**A**LCOHOL, the product of the fermentation of sugar by the yeast plant, forms part of the daily diet of many people and is consumed in this country in enormous quantities. In various parts of the world, and very notably in our own country huge areas of the land that might be growing wheat are devoted to the growing of plants of one kind or another which produce a quantity either of sugar or of starch that can readily be turned into sugar for the making of alcohol. We are so crowded in Great Britain that the greater part of our food has to come from the rest of the world, and the rest of the world is already beginning to demand higher prices for that food because populations everywhere are increasing and soon the nations will want to eat all their own wheat themselves. The time will necessarily come when our descendants in England will be compelled by the greatest of powers, that is need of food to grow wheat where now they grow plants for alcohol.

## ALCOHOL, THE ENEMY OF LIFE

**B**EFORE we study the effects of alcohol upon the body and especially upon the bodies of children there is also another point that everyone ought to know and remember. In this country we spend more than £160 000 000 a year on alcoholic drinks. Let us suppose for a moment that these do no harm to anyone but that this enormous sum of money is spent on what is neither good nor bad. Now if there is anything that is perfectly certain it is that in the present state of the world we islanders whom the rest of the world feeds, require ships to protect us. It is a shameful thing that this should be so and that nearly two thousand years after the birth of Christ we should be no better than we are but it is so.

The only objection to building sufficient ships is their cost. If they cost nothing, or if we could afford what they cost without any trouble at all we should build just as many as we pleased, so that no one need have a moment's anxiety and so that the rest of the world would be certain to leave us in peace. The people who are for me declare that we ought to build eight battleships every year. Now the biggest and newest kind of battleships costs rather less than £1 500 000 and so to build us it would cost £12 000 000 a year. But if we chose to spend in building

battleships and making ourselves and our children safe the money we now spend

on drink we could build a hundred improved Dreadnoughts every year and have a handsome margin over. That

would be one advantage of saving the £160 000 000 which we spend on alcohol even assuming that we buy no harm for ourselves with the drink.

But it can easily be shown that the expenditure of this huge sum on drink means not merely the loss of so much money. If we took it all and threw it into the sea every year we should be a thousand times better off. As it is we buy death and disease and crime and poverty and insanity and cruelty to children all of them in rich abundance, with this money. Wealth is either life or what serves life and still it is what injures life. But men take the land and the sun, the stone and the water and the air which ought to be essential wealth because they build up life and with these they grow grapes, and barley and so forth which they turn into all these horrible things.

We grow death where we should be growing life and our deadly crop never fails. However we are going to study that more carefully later. Meanwhile let us put aside for that what we say about drink and say that what we say is enough every year a hundred Dreadnoughts every year. What it does for us we had better



## THE CHILD'S BOOK OF ITS OWN LIFE

On April 1 1909, there came into force in England a new law, for which some of us who love England have been working hard for some years past. Every child should know about this law, for, indeed, its name is the Children Act, and it is the greatest law ever passed in this country for the life and health and happiness of children. It deals with many things, and among them it deals with this question of drink.

### HOW TOBACCO AND ALCOHOL STOP THE DEVELOPMENT OF A CHILD

Let us go very carefully into what this new Act says, and see the reason for it. All children, and all who are responsible for children, must know about it, because it says there are certain things that they must not do that thousands of people have up till now been doing all over the country.

It is true of every living creature, without any exception, that any poisonous substance is more injurious to it when it is young than when it is grown up. It is not because the creature is smaller, and not because it is growing or getting bigger, but because it is developing. There is all the difference in the world, we know, between growing and developing. Anything that is developing is delicate, and if we have the least idea of what a miracle development is, we can well believe that it should be so. Now, we all know that tobacco and alcohol are poisons. There is no form of life, animal or vegetable, that they will not destroy. For the first time in the history of England the Children Act recognises this. According to it, and by its provisions, no cigarettes, and no tobacco in any other form for the use of a child, are to be sold to any child under the age of sixteen. No doubt this is quite right, but it is a perfectly trivial matter compared with the question of alcohol.

### THE GREAT LAW THAT HAS SAVED THE CHILDREN FROM THE PUBLIC-HOUSE

As regards alcohol, none is now allowed to be given to children under five years old, unless ordered by a doctor, or given as medicine to a child that is ill. That this is a right provision everyone will agree, because we know that the giving of alcohol to children at such ages is very bad for them. But it is difficult to see how this part of the law can be made to work.

There is, however, another part of the Act for which everyone who cares at all for England must work, and the work is still needed though the Act has become law. No child under fourteen years of age is to be allowed, at any time, in the bar of any public-house where the liquor is consumed, or of any other place licensed to sell drink. This does not apply to railway refreshment rooms.

People may suppose that this new law is of little importance because children would not be taken into public-houses. That, however, is a great mistake, for children have been taken into public-houses in England in great numbers. The last day of March, 1909, was happily the last day on which tens of thousands of babies and small children could be taken, with the permission of the law, into the public-house bars of this country.

It has been supposed that the reason why we object to having children taken into the public-house is that they hear bad language there. But though that is not a nice thing, yet we are far more concerned about health than about that, as regards infants, to whom all language is the same because they cannot understand it.

### WHY CONSUMPTION IS VERY LARGELY A PUBLIC-HOUSE DISEASE

The first very serious objection to taking children into the public-house is that they catch diseases there, and especially the most deadly of all diseases, which is consumption. Consumption in its various forms causes nothing like so many deaths as alcohol, but of all the things that we call disease it is the most deadly. It is what is called "catching." It is due, we know, to microbes, and these spread from one person to another. It used to be supposed that children did not suffer much from consumption, but we know now that they do. The amount of consumption among young school children, and, indeed, at any time after the first year, is terribly high in this country, and we have lately learnt that consumption ought almost to be called a public-house disease. It is probable that at least one-half of all cases of consumption are due to infection in the public-house. Very many unhappy consumptive persons spend much of their time in the public-house. There they spit. It is probable that





on any evening a small portion of the sweepings from public house floors would be found to contain active living microbes of consumption in the case of at least one public house in three. Everyone who enters a public house is entering a plague spot for consumption is the greatest plague of our day.

#### THE CRUELTY OF ALLOWING BABIES TO CRAWL AMONG THE OLMS OF DEATH

Now the tiniest babies still in their mothers arms very rarely suffer from consumption in any of its forms. Evidence shows that the danger seems to come when crawling begins. The child that crawls on the public house floor and even the small child that walks upon it are in far graver danger than grown up people because the nearer the mouth and nose are to the floor the more likely are the microbes to make an entry. The crawling child is almost certain to get the infection upon its fingers and so to its mouth. To the eye of the doctor there can scarcely be a more disgusting or cruel spectacle than that of a small child crawling or toddling along the infected floor of a public house which he knows to be covered with the germs of death.

Fortunately for mankind we do not always catch diseases even when the microbes that make them enter our bodies. The microbes are the seed but our bodies are the soil and the seed cannot grow if the soil is not suitable. In the case of consumption nothing seems to make the soil so unfit for the deadly seed as the breathing of foul air. That of course is why we should always sleep with our bedroom windows open. With dust and bad ventilation and everything that comes off from dirty skins and clothes not to mention tobacco-smoke there is no doubt that the air of the public houses is the worst to be found anywhere. So where the seed is most abundant we also provide the very conditions which make the soil deadliest for it.

#### HOW THE DRINKING OF ALCOHOL HELPS TO SPREAD CONSUMPTION

One other thing will make the soil richer still for the deadly seed to grow in and that is to prepare it with a weed. It is still a weed by its very nature that alcohol gives to consumption. We know that the exact reverse is true. In France this has been

proved that wherever the amount of alcohol drunk is high the amount of consumption is high and where it is low the amount of consumption is low. One district which consumes just about three times as much alcohol as another has rather more than three times the death rate from consumption.

Now it has been generally supposed that children do not get alcohol to drink in this country that even those who are taken into the public house very rarely get any alcohol given to them. But we are learning that this is not the case and that the truth of things here is not so very different from that which has been known for some time on the continent of Europe.

In Germany and Austria the most serious harms have lately been caused by the discovery that not merely women—which means mothers—but also children take far more alcohol than used to be supposed. Of the total number of school children in Vienna one in three drinks beer regularly, one in twenty drinks wine and one in thirty drinks spirits. In a large German town a government doctor studying more than four thousand children found that 71 per cent drank beer or wine daily. In a class of seventy-one children between seven and nine years of age twenty-one had drunk brandy.

#### THE MILLIONS OF SCHOOL CHILDREN WHO ARE ALLOWED TO DRINK ALCOHOL

Quite lately careful inquiries have been made in England to see whether the same thing is to be found there. In several infant schools in London over 40 per cent of the infants of both sexes drink alcohol more or less regularly. As far as the present inquiry has gone it is probable that there are nearly 3,000,000 child drinkers in London and some 2,000,000 elementary school children in England and Wales who more or less regularly drink alcohol. It is quite evident that the new law which needed the help of no man being able to give a sane reason why children should be allowed to take alcohol after they are five years of age and yet not be allowed to take it as long as they reach sixteen.

There is a very clear reason why alcohol should not be given to children in the way they are permitted to take it. It is that the two are not the same thing.

from its grown up state the creature is, the more is it affected by the poison. That, of course, we can understand. The earlier the period of development, the more serious is a wrong step, the further, so to speak, the creature will go out of its right way.

**THE BRAIN THAT IS MORE WONDERFUL THAN ANYTHING ELSE IN THE UNIVERSE**

The second point is that alcohol and other substances like it affect the body, whether developing or already grown up, in a certain precise order. Our bodies are made up of many parts, some of which we may look upon as older than others, and those which are older we must also look upon as lower. The backbone, for instance, is very old, for we know it is as old as the fishes. Parts of the brain are very old, but we can trace in the brain, quite clearly, newer parts which are higher in their duties and more easily upset. There is, indeed, a part of the brain which is often called the new brain. It is by far the most wonderful thing in the whole universe, so far as we know it, and we shall study it later. Meanwhile, the point is that the newest and highest parts of the brain are also the most delicate. They are the most likely to be injured by anything when we are grown up, and if anything interferes with development, they will be the most certain to suffer. The same is true of injury done by old age or by disease, *the last to come is the first to go*.

"Last to come" has a double meaning, because it applies both to the race to which we belong, and to ourselves as individuals. The parts and powers of the brain that develop last in ourselves, as we grow up, are those that have developed last in the history of the great line to which we belong.

**THE GREAT LAW THAT THE LAST TO COME IS THE FIRST TO GO**

The rule is that when the individual is damaged in development, or is poisoned by anything that acts at all upon the brain, or grows old and begins to go downhill, as we say, that which last came is the first to go. On the other hand, the very oldest part of the brain, such as the part by which we breathe, is the least delicate. It is the first to come and the last to go. Every other part of a man's brain may have been practically destroyed, and he may be

quite unconscious from a huge dose of alcohol, but the part of his brain which makes him breathe will hold on to the last; until, perhaps, the alcohol poisons even that, and then he dies.

This law about the different levels of the brain ought to be known by every intelligent person in the world, because it is the greatest discovery ever made in this branch of science. It was made by an Englishman, Dr. Hughlings Jackson, who is still alive.

Alcohol perfectly illustrates Jackson's law in every part of it. When young children are exposed to the effects of alcohol, their development is interfered with most in its highest parts. That is the terrible thing about alcohol, and other substances like it, that they strike at us where we are most human, and interfere less with the least human parts of us. There are some hundreds of thousands of persons in England to-day, of all ages, whose brains and minds have not properly developed. The most moderate figure is about a quarter of a million, but we know that that is far under the real facts. The lives of these persons are worth nothing to themselves and much less than nothing to us.

**THE CELLS OF OUR BRAINS THAT CAN NEVER BE REPAIRED**

We, of course, have to pay for their keep, and for all sorts of terrible evils, like crime, and drunkenness, and cruelty to children, which flow from the existence of these people. They all illustrate the truth of Jackson's law. The highest, the latest, the most delicate, the most human part of their brains has been injured, but they breathe as well as we do. No power on earth can repair this injury. It is one of the most remarkable facts about the brain, or, indeed, about nerve-cells anywhere, that once destroyed they are destroyed for ever. No new nerve-cells can be made beyond those with which we are born, and no damaged nerve-cell ever recovers. Now, alcohol is very largely responsible for the making, and for the existence, of these unfortunate children and grown-up people; and all of them are so many terrible illustrations of Jackson's law.

Jackson's law applies in just the same way to cases where people of any age take a large enough dose of alcohol to affect their brains. They may do

themselves no permanent harm but while the brain is under the influence of alcohol we find that the last to come is the first to be affected and to be the most affected. Now it is very interesting for us to ask ourselves what it is in our brains and minds that is the very highest and latest thing

#### THE POWER OF SELF CONTROL THAT MAKES MAN HIGHER THAN THE ANIMALS

What is it that a child learns last and finds most difficult to learn? What is it that some grown up people have never learnt? What is it that makes the difference between the highest type of man whom we can trust always, and always be sure of and other people of whom we cannot be so sure? It is not the power to move one's body certainly nor is it the power to see and hear nor yet the power to speak. It is not even the power to think though people are apt to suppose so until they look into the matter. It is *self control*. In creatures other than man there is almost no self-control. We may watch them at the Zoo year in year out and we shall find no signs of it. If we train one of the most intelligent of all animals, such as the dog, it is only fair to say that we find the beginnings of self-control there but that, of course is with man's help. The greatest thing, in us—apart from love which is greater in one sense—is the power to say No. the power not to yield to this, or that or the other because of some consideration which we have in our minds and which we regard as of higher importance.

Now it is the mark of savages—by which we mean real savages not highly educated and cultured people like Indians and Chinese whose ancestors were civilised thousands of years before ours were—that they have very little self-control. They act quickly impulsively as we say. The highest part of the brain is not so well developed in savages as it is in us. In children, self control is not an easy thing.

#### WHY CHILDREN CRY AND GROWN UP PEOPLE DO NOT

When a child is hurt it cries. Older people may be hurt just as much but why they do not cry. The brain has learnt how to control the tears. In the same way children will say I have read this than grown up people at a dinner party but it is very difficult to keep

laughing at times when it is not at all polite to other people to do so. Now lack of self control is the most certain and constant mark of defective minded people of all kinds and it is the first and most certain mark of poisoning by alcohol and other things of that class that they strike at the most human thing in us the last to come and the first to go. People who could keep their temper without alcohol lose their temper under its influence. They start laughing or crying and cannot stop at things which would not have made them either laugh or cry when they were all right. They do rash things when anyone puts the idea into their heads. They lose their caution and their judgment. They say things that they would not usually have said. We commonly suppose that the first effects of alcohol are when the muscles of a man's body are affected. But that is a great mistake. The first effect of poisons of this kind is shown upon the highest parts of the brain which have nothing to do directly with any muscles.

#### HOW ALCOHOL SPOILS THE HIGHEST POWERS OF MAN

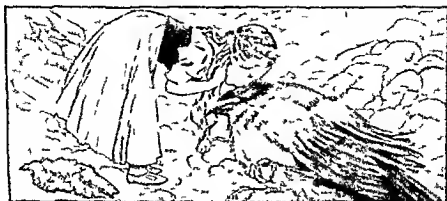
It is only later that the levels of the brain which work the muscles are affected and always the law of Jackson holds good and these parts of the brain are affected less than the parts above them. The latest and most delicate movements are affected first. The most human movements, so to speak are those of the thumb and these are injured very quickly as the writing, 'how' or any kind of delicate movement in which the thumb is concerned. Then the delicate movements of speech are affected and next the delicate movements by which the two eyes work together. Under the influence of alcohol the work separately so that it appears as double. Afterwards the coarser movements, such as those of a man, are affected but as we have already learnt, the movements of the brain remain to the last.

None of this is very pleasant reading if we think of it as a hat but for every day to the minds of persons. But now we can see at it in the power of view of the wonderful effects of Dr Jackson which is the brain tells us that it is a very serious thing.

## THUMBELINE FLOATED DOWN THE STREAM



Thumbelina became happy again, for everything she passed was so lovely in the sunshine, and the birds on the branches sang to her as she floated by with her pretty butterfly tied to the leaf of the water-lily with her sash



## LITTLE TINY THUMBELINE

ONCE upon a time there lived a young wife who longed to possess a little child so she went to a fairy and said to her "I wish very much to have a child a little tiny child. Will you give me one dear fairy?"

"With all my heart," replied the fairy, "sow this barleycorn in a flowerpot and then see what will happen."

"Thank you, thank you!" cried the woman, giving the fairy a silver coin. Then home she went and planted the barleycorn and immediately there sprang up a large flower like a tulip but with its petals tightly closed like a bud.

"What a lovely flower!" said she, and she kissed it. The bud opened at once with a loud voice and there in the centre of the flower sat a little tiny girl about an inch high, scarcely bigger than her thumb. So she called her Thumbeline and put her to bed in a walnut shell with violet leaves for her mattress and a rose leaf for a quilt. During the day she told Thumbeline stories and taught her to sing as she played on the table beside her.

But one night a great wet night toad came and stole away the cradle with little Thumbeline asleep in it and carried it off to her home in the muddy bank of the pond.

"This is just the wife for my son," thought she. "But when her son

saw her all he could say was 'Croak, croak, croak!'"

Don't think so much now or you'll wake her, and the old Mother Toad. She may easily escape for she is as light as a feather. We must take her out and place her on one of the large water lily leaves in the middle of the brook, while I prepare our house for you both.

This they did and when poor little Thumbeline awoke and found herself in the middle of the stream she cried most bitterly.

As soon as old Mother Toad had decorated her home with bulrushes and yellow buttercups she and her hideous son swam out to the leaf to fetch the cradle so as to place it in their new home before taking the little girl and herself there.

Old Mother Toad bowed low in the water and said, "Here is my son who is going to be your husband. I will come and fetch you soon and you will be very happy together."

Then they swam off with the cradle and poor little Thumbeline wept bitterly. Now some little fish had overheard old Mother Toad and when they saw the little maid weeping they gathered away the stem of the leaf and away it floated down the stream so fast that the toad and her son could not catch it. Thumbeline was very happy again for everything she dreamed was so lovely in the world as this.

birds on the branches sang to her as she floated by. A pretty little butterfly hovered round her, and at last settled for a moment on the leaf, for he loved her very much. She was pleased, too, and tied him to the leaf with her sash.

But presently a great ugly cockchafer came buzzing past. He caught sight of her, and snatching her off the leaf, flew up with her into a tree, but the poor butterfly could not free himself, and went floating along downstream. The cockchafer gave Thumbeline some honey to eat, and praised her beauty; but when the henchafers saw her, they said that she was just like a human being.

"How very, very ugly she is!" they all cried, and at last the cockchafer disowned her and they all flew down with her and set her on a daisy. Then she wept because she was so ugly that the henchafers would have nothing to do with her.

All the summer Thumbeline lived alone in a wood, dining off the honey from the flowers, and drinking the dew that every morning spangled the leaves around her. But then came the cold, long winter; the flowers all died, the birds flew away, and the snow began to fall. Poor hungry Thumbeline wandered through the stubble of a cornfield hard by until she came to the hole of a field-mouse, who dwelt snugly down in the ground, having a room full of corn, and a neat kitchen and store-room.

Thumbeline stood at the door and begged for food.

"Poor little thing!" said the good-natured field-mouse. "Come into my warm room and dine with me." And she soon became so fond of the tiny maid that she said "You may dwell with me all the winter, if you will only keep my room clean and neat, and tell me stories, for I love stories dearly." And Thumbeline agreed, and was very happy in her new home.

In a few days' time the field-mouse said "We shall have my next-door neighbour, the mole, in to visit us tomorrow, he comes to see me once a week. He is richer than I am, has large rooms in his house, and wears a beautiful black velvet coat. It would be capital if you married him, but he is blind, and cannot see you, so you must tell him your prettiest stories."

When he came, Thumbeline sang to him, and he soon fell in love with her. He invited them to walk down a long, dark passage that he had just burrowed from their house to his, lighting them with a piece of tinder.

But when they had gone a short distance they found a swallow lying stretched on the floor; the poor bird had evidently died of cold. Thumbeline felt very sorry, as she loved all the birds, but the mole kicked it with his short legs, saying

"Here's a fine end to all its whistling! What a miserable thing it must be to be born a bird! None of my children will be birds, thank goodness!"

But Thumbeline could not sleep that night, so she got up, and wove a carpet out of hay and then went and spread it round the bird, she also covered it with some warm, soft cotton.

"Farewell, dear bird," said she; "farewell, and thank you for your beautiful song in the summer, when all the trees were green and the sun shone so warmly upon us." And she pressed her head against his big body. To her great surprise she felt something beating within it. It was the bird's heart, and he was not really dead. She quickly laid the cotton more closely round him, and he gradually revived.

He remained underground all the winter, and Thumbeline was kind to him and brought him water and food, but she never said a word either to the mole or the field-mouse.

As soon as the spring came the swallow said farewell to Thumbeline, who would not go with him, because she knew it would vex the old field-mouse if she left her.

Thumbeline was now sad indeed, for she was not allowed to go into the warm sunshine.

"This summer you must work and make your wedding clothes," said the field-mouse, for the blind, dull mole had decided to marry Thumbeline.

So the tiny maid was obliged to work hard at the distaff, and the field-mouse hired four spiders to spin and weave.

Every evening the mole came and talked about how the summer was coming to an end, and he abused the sun and pretty flowers so much that Thumbeline disliked him more and more, and said she would not marry him.

Fiddlestick! cried the field mouse  
Don't be obstinate child or I will  
bite you with my white teeth

At last the day fixed had arrived and  
Thumbelina went to bid a last farewell  
to the beautiful sun before going to dwell  
with the mole deep down in the earth

Farewell thou glorious sun! she  
cried as she walked a little way

Tweet tweet! And she heard a  
fluttering of wings and there was the  
little swallow She told him her sad  
fate and how she longed to be free

The cold winter will soon be here

ruined palace of white marble and here  
the swallow had built his nest

This is my home said the swallow  
but I will take you to see the  
splendid flowers growing beneath them  
and you shall dwell in one of them

But what was her surprise when he  
saw sitting on the flower a little minni-  
kin wearing a gold crown on his head  
and the brightest most delicate wing  
on his shoulders scarcely any bigger  
than herself He was the spirit of the  
flower and in every flower there dwelt  
one such fairy and he was their king



ALL THE FAIRIES CAME OUT FROM THEIR FLOWERS AND BROUGHT THUMBELINE PRESENTS

and the swallow I shall fly far  
away to the warm countries I come  
with me sweet little Thumbelina who  
did save my life when I lay frozen in  
the dark earth

Yes I will go with thee said she  
and she seated herself on the little  
back and then the swallow soared high  
into the air and flew away over forest  
lake and mountain until they reached  
the warm countries There the day  
seemed twice as long as twice as long  
and there grew the loveliest garden  
with purple grapes and crimson flowers  
And a silver brook like silver and gold

When he saw Thumbelina he was  
delighted for he had never seen so  
lovely a maiden So he put his gold  
crown on her head and a diamond  
on her queen And the king and

Yes and then all the fairies came  
out from their flowers and brought  
presents and the best of all was a  
diamond ring which she had to  
take from the king's finger

And she was so happy that she  
began to sing and the king and queen  
and all the fairies joined in the  
song We mutually love  
And so she lived a very happy

# NAPOLEON FLIES FROM HIS FIELD OF DOOM, TO CARRY THE NEWS OF HIS FALL TO PARIS



After the defeat of his army and the run of all his hopes at Waterloo, Napoleon fled from the battlefield in a carriage. But the Prussians were following so closely that Napoleon had to leave his carriage for a horse, and scarcely had he quitted his seat when the vehicle with its horses fell into the hands of the pursuers. In his haste he left his hat in the carriage.

This striking picture of a great scene in history is from the painting by Mr. Lionel Crofts, R.A. which is now hanging in the Walker Art Gallery, Liverpool.





## LITTLE IDA'S FLOWERS

"MY poor flowers are quite faded," said little Ida. "Only yesterday evening they were so pretty, and now they are all drooping! What can be the reason of it?" asked she of the student who was sitting on the sofa beside her.

"Do you not know?" replied the student. "Your flowers went to a ball last night, and are tired, that is why they all hang their heads."

"Surely flowers cannot dance!" exclaimed little Ida.

"Of course they can dance! When it is dark, and we are all gone to bed, they jump about as merrily as possible. They have a ball almost every night."

"May their children go to the ball, too?" asked Ida.

"Yes," said the student, "little daisies and lilies of the valley."

"And where do the prettiest flowers dance?"

"Have you never been in the large garden in front of the king's beautiful summer palace, the garden so full of flowers? Surely you recollect the swans which come swimming up to you when you throw them crumbs of bread? There, you may imagine, they have splendid balls."

"I was there yesterday with my mother," said Ida, "but there were no leaves on the trees, neither did I see a single flower. What could have become of them? There were so many in the summer-time!"

"They are now at the palace," answered the student. "As soon as the king leaves his summer residence, and returns with all his court to the town, the flowers likewise hasten out of the garden and into the palace, where they enjoy themselves famously. Oh, if you could but see them! The two loveliest roses sit on the throne, and act king and queen. The red cockscombs then arrange themselves in rows before them, bowing very low, they are the gentlemen of the bed-chamber. After that the prettiest among the flowers come in, and open the ball. The blue violets represent midshipmen, and begin dancing with the hyacinths and crocuses, who take the part of young ladies. The tulips and the tall orange-lilies are old dowagers, whose

business it is to see that everything goes on with the most perfect propriety."

"That is very funny," said Ida, clapping her little hands, "but could not I see the flowers?"

"To be sure you can see them!" returned the student. "You have only to peep in at the window next time you go to the palace."

Little Ida thought what the student had told her about the flowers was very droll, and she could not leave off thinking of it. She was now sure that her flowers hung their heads because they were tired with dancing so much the night before. So she took them to the pretty little table where her playthings were arranged. Her doll lay sleeping in the cradle, but Ida said to her, "You must get up, Sophy, and be content to sleep to-night in the table-drawer, for the poor flowers are ill, and must sleep in your bed, perhaps they will be well again by to-morrow."

Ida then laid the faded flowers in her doll's bed, drew the covering over them, and told them to lie quite still.

All the evening she thought of nothing but the student's words, and just before she went to bed she ran up to the window where her mother's tulips and hyacinths stood behind the blinds, and whispered to them, "I know very well that you are going to a ball to-night." But the flowers moved not a leaf, and seemed not to have heard her.

After she was in bed, she thought for a long time how delightful it must be to see the flowers dancing in the palace. Soon she fell asleep, but during the night she awoke, she had been dreaming of the student and the flowers. All was still in the room, the night-lamp was burning on the table, and her father and mother were both asleep.

"I wonder whether my flowers are still lying in Sophy's bed?" said she. "I should very much like to know." She raised herself a little, and, looking towards the open door, she saw that the flowers and all her playthings were just as she had left them. She listened, and it seemed to her as if someone must be playing low, sweet music on the harpsichord somewhere quiet near. "My flowers must certainly be dancing," said she. "Oh, how I should

like to see them' ' But she dared not get up for fear of waking her father and mother. At last she could restrain herself no longer so she crept lightly out of bed and stole towards the door of the room. Oh, what wonderful things she saw!

There was no night lamp burning here it was quite light in the room for the moon shone brightly through the windows on the floor. All the hyacinths and tulips stood there in two rows while their empty pots might still be seen in front of the windows they

to be quite well again and danced as merrily and happily as the rest. Suddenly a heavy noise was heard and Ida saw that it was the rod which she had found on her bed on the morning of Shrove Tuesday. It was certainly a very pretty rod for a wax doll was fixed on the top wearing a broad brimmed hat with a blue and red ribbon tied round it. It hopped upon its three red stilts in the middle of the flowers, and stamped the floor with its feet. It was dancing the mazurka which the flowers could not dance.



"The two lovable roses sit on the throne and act king and queen, and all the prettiest flowers come in and upon the ball," continued the student. "That is very funny," said Ida, clapping her little hands.

performed figures, and took hold of each other by the long green leaves. At the harpsichord sat a large yellow lily, bowing her long yellow face now on one side now on the other, and nodding her head to raise the air. A tall blue crocus rose up, and forward sprang upon the table on which lay Ida's playthings, and drew back the curtains. There lay the two flowers, but they ran immediately and greeted the other flowers who invited them to dance with them. The two flowers appeared

they were too light-footed to stamp. A loud knocking was now heard from the drawer in which lay Ida's doll. It was Sohy who made the noise. She put her head out of the drawer and asked in great astonishment:

"Is there a ball here? Why, has no one told me of it?"

"And you dance with me?" asked the ru-crackers.

"Certainly you are not a very large size to dance with me!" said Sohy, turning her back upon them. But the two flowers on the table exclaimed that

though it may be a much longer distance by road, or rail, or river, yet it is only twenty miles in a straight line "In a bee-line" means the same thing, for a bee, when laden with honey, goes straight home to the hive.

**DOGS** "To go to the dogs" means to go to the bad "Dogs" is probably from a term in dice-playing, where "to throw three dogs," that is, three aces, meant to have bad luck

**FIG** In the phrase "I don't care a fig for you," fig here means *figo*, the Italian for a snap of the fingers

**FRENCH LEAVE** "To take French leave" means to do a thing without asking permission The French soldiers used to take what they liked from a conquered city, without asking leave or paying

**GORDIAN KNOT** "To cut the Gordian knot" means to find the way out of a difficulty Once upon a time, a man called Gordius tied his wagon to a beam so tightly that no one could untie it Alexander the Great was told that any man who undid that knot would become king So he simply cut the knot with his sword

**GREEK KALENDS** "To put a thing off till the Greek kalends" means that it will never be done, for there were no kalends among the Greeks The kalends were the first of the month in the Roman way of measuring time, and so we get our word calendar

**HALCYON DAYS** are days of calm and happiness—literally, "kingfisher days," from the idea that the kingfisher laid its eggs on the surface of the sea in the calm, happy days before winter.

**HAUL OVER THE COALS** This means to scold or punish a person. It probably refers to the days when people were tried by being held over a fire, if the fire burnt them, they were supposed to be guilty.

**HOIST** "To be hoist with one's own petard" means to be blown up by an explosion that one has caused oneself, and so to fall into one's own trap. A petard was a mortar filled with gunpowder, used for blowing up gates or barricades.

**LURCH** To leave a man in the lurch means to leave him in a difficult situation without help Lurch is a word used in the game of cribbage, to mark the position of the player who has

scored every point before the other has begun to score

**MAD AS A HATTER.** Hatter is really *adder*, the word for *adder*. So the phrase means "as mad as an adder"

**MARE'S NEST.** When a person has made what he thinks is an interesting discovery, and it turns out to be nothing after all, we say "he has found a mare's nest" The allusion is to Mara, a kind of demon, whom people used to think had a nest filled with wonderful treasures. The same demon gives his name to night-mare.

**NAIL.** "To pay down on the nail" means to pay ready money In front of the Exchange in some cities there used to be a pillar called the nail, and on this pillar, or nail, people used to put down the money which they had to pay when they had bought anything

**NICK.** "In the nick of time" is a familiar phrase The old way of counting, or of keeping accounts, was by cutting notches in a stick These notches were called nicks. At certain schools and universities it used to be the custom to put a nick against each pupil's name as he entered chapel Those who left going in till the last minute, and were all but late, were then said to be just in the nick of time

**PAY THE PIPER** When the Pied Piper of Hamelin, about whom we read on page 533, had cleared the town of rats and mice, the people refused to pay him what they had promised. So he led all their children away by piping so beautifully that they all followed him away for ever. So "to pay the piper" now means to pay up what one owes

**PETER AND PAUL** "Robbing Peter to pay Paul" means to steal something from one man to pay another. Much of the money belonging to St. Peter's, Westminster—better known as Westminster Abbey—was taken for the repair of St. Paul's Cathedral

**POINT.** To dine on "potatoes and point," or to eat "bread and point," means to have a very poor dinner. When salt was dear, and poor people could not buy it, they used to tell their children to point their potato or bread at the empty salt-box, and then eat it, imagining it had been dipped in salt.

**RAIN CATS AND DOGS** This means a heavy downpour of rain, accompanied by wind. Dogs used to be thought to

be the signal of much wind, and cats were supposed to influence the weather.

**RAP** Not worth a rap means worthless. The rap was a counterfeit coin current in Ireland for a halfpenny in the time of George I. and really worth about half a farthing.

**RED LETTER DAY** This means a day that stands out in our life as a happy and delightful day. In almanacs saints' days and holidays used to be printed in red ink to mark them off from ordinary days.

**ROLAND** To give a Roland for an Oliver is a common expression. Roland and Oliver were two of the great knights of the Emperor Charlemagne. Once when they fought each other, the conflict lasted five days and at the end it was what we call a drawn battle that is neither won. So to give a Roland for an Oliver means to give tit for tat.

**RUBICON** To cross the Rubicon means to take some course of action from which we cannot possibly go back. The Rubicon was a stream between Italy and Gaul and when Julius Caesar crossed the Rubicon he had passed from his own province of Gaul and had actually begun to invade Italy.

**UMBRAGE** To take umbrage means to take offence. The word comes from the Latin *umbra* meaning shade or gloominess.

**WALLS HAVE EARS** In old days buildings were sometimes constructed having tubes hidden in the walls so that what people were saying in one room could be heard in another room far away. So the phrase walls have ears came to mean 'Take care what you are saying; you may be heard by someone who will repeat what you say.'

## ARITHMETIC

### MULTIPLICATION & DIVISION OF FRACTIONS

BEFORE we begin the multiplication of fractions let us work an example requiring both addition and subtraction.

#### EXAMPLE

Find the value of  $4\frac{1}{2} + \frac{3}{4} - 2\frac{1}{2} - \frac{1}{4}$ .

Here we are required to add together  $4\frac{1}{2}$  and  $\frac{3}{4}$ , and to take both  $2\frac{1}{2}$  and  $\frac{1}{4}$  from the result. One method would be to work two addition sums,  $4\frac{1}{2} + \frac{3}{4}$  and  $2\frac{1}{2} + \frac{1}{4}$ , and then take the second result from the first. But we can arrange our work so that it is not necessary to find these two results.

$$\begin{aligned} & 4\frac{1}{2} + \frac{3}{4} - 2\frac{1}{2} - \frac{1}{4} \\ &= 2 + \frac{27}{72} + \frac{10}{72} - \frac{36}{72} - \frac{4}{72} \\ &= 2 + \frac{37 - 100}{72} \\ &= 2 + \frac{100 - 100}{72} \\ &= 2 + 0 = 2 \end{aligned}$$

Just deal with the whole numbers: take 2 from 4. Then express the fractions with their least common denominator 72. This gives us the second line of the work shown above. Now collect the numerators which are to be added 27 and 10, obtain 37. Then the numerators which are to be subtracted 36 and 4, obtain 40. The remainder of the work is now very easily done.

the subtraction sums which we already know quite well how to do.

Proceeding to multiplication we must first learn to multiply a fraction by a whole number. For example suppose we multiply  $\frac{1}{3}$  by 3. Just as 5 times 3 means that we are to take 3 three times and add the results, thus  $5 + 5 + 5$ , so  $\frac{1}{3}$  times 3 means that we are to take  $\frac{1}{3}$  three times, and add the three quantities together.

Evidently then  $\frac{1}{3} \times 3 = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$  or  $\frac{3}{3}$ . Therefore to multiply

a fraction by a whole number we multiply its numerator by the whole number. If necessary we then reduce the result to a mixed number or to its lowest terms.

Again suppose we multiply  $\frac{1}{3}$  by 3. The result is  $\frac{3}{3}$  which can be reduced by cancelling the factor 3 in both to obtain 1. Now these  $\frac{3}{3}$  is reduced to lower terms because our multiplier, 3, is a factor of the denominator, 3. If a whole number is not a factor of the denominator we divide the numerator by that number.

#### EXAMPLES

- (1)  $\frac{1}{3} \times 3 = 1$  Multiplier 3 is the numerator 3.  
(2)  $\frac{1}{3} \times 6 = 2$  Divisor 3 is the denominator 3.

Next we will consider how to divide a fraction by a whole number. Suppose we wish to find the result of dividing  $\frac{2}{3}$  by 3. The fraction  $\frac{2}{3}$  means that a unit was divided into 3 equal parts, and 2 of the parts taken. Now, if we divide each of the 3 parts into which the unit was divided into 3 equal pieces we shall have the unit divided into 9 equal pieces, so that each part will be called a ninth, or  $\frac{1}{9}$ . Therefore, the two original parts which formed  $\frac{2}{3}$  each give us 3 of these ninths, so that, together, they make 6 ninths. Evidently, if we divide 6 things by 3, we get 2 for a result, so that 6 ninths divided by 3 gives 2 ninths, so that the result of dividing  $\frac{2}{3}$  by 3 is  $\frac{2}{9}$ . But we obtain  $\frac{2}{9}$  from  $\frac{2}{3}$  if we multiply the denominator, 3, by 3. Therefore, to divide a fraction by a whole number, multiply its denominator by the number. This number may possibly be a factor of the numerator, in which case we should reduce the fraction to its lowest terms by dividing numerator and denominator by that number. Thus, we can also divide a fraction by a whole number if we divide its numerator by that number.

Our next step is to multiply a fraction by a fraction. Multiply  $\frac{2}{3}$  by  $\frac{3}{4}$ . In just the same way that  $\frac{2}{3} \times 3$  means that we are to take 3 of the fractions  $\frac{2}{3}$ , so we may consider that  $\frac{2}{3} \times \frac{3}{4}$  means that we are to take  $\frac{3}{4}$  of the fraction  $\frac{2}{3}$ .

Now, to obtain  $\frac{3}{4}$  of a thing we must divide it into 4 equal parts and take three of them. By what we have already learned we know that if we divide  $\frac{2}{3}$  into 4 equal parts, we obtain  $\frac{2}{12}$ , and that if we take 3 parts each equal to  $\frac{2}{12}$ , we obtain  $\frac{6}{12}$ .

Thus,  $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$ . But 10 is  $5 \times 2$ , and 21 is  $7 \times 3$ , so that the result is obtained by multiplying the numerators together for a new numerator, and multiplying the denominators together for a new denominator. If the result can be reduced to lower terms we proceed to cancel it down. Evidently, then, we may cancel before we multiply numerators and denominators.

#### EXAMPLES

- (1)  $\frac{7}{8} \times \frac{16}{3} = 3$  Here, we see that 7 will divide into the numerator 7 and into the denominator 21

We therefore cross out the numerator 7, and suppose a 1 written above it; and we also cross out the 21 and write 3 under it, since 7 goes 3 times into 21. Similarly, 8 will cancel into 16. We now have only 2 left in the numerator and 3 in the denominator. Hence, the result is  $\frac{2}{3}$ .

(2)  $1\frac{1}{2} \times 4\frac{1}{2}$  Here we must first express the mixed numbers as improper fractions; we then proceed as before, and obtain  $8\frac{1}{2}$ , which, as a mixed number, is  $8\frac{1}{2}$ .

If there are more than two fractions in the sum, the process to be followed is exactly the same.

(3)  $2\frac{1}{2} \times \frac{3}{4} \times 1\frac{1}{2}$  Here, 9 cancels into 27, and the result, 3, cancels into the numerator, 3, remember, then, that we have 1 instead of each of these. Similarly, 4 cancels into 8, and the result into the 2 below. We have, therefore, 1 for each numerator, and 1 for each denominator, so that the whole result is 1.

Finally, we have to learn to divide a fraction by a fraction. Suppose we wish to divide  $\frac{2}{3}$  by  $\frac{3}{4}$ .

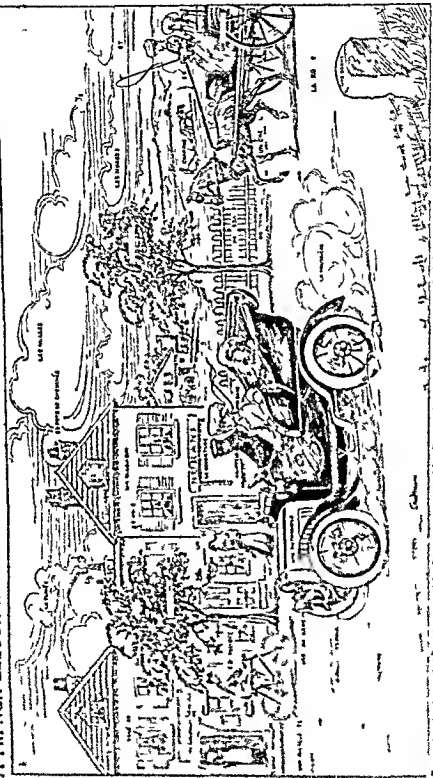
If we divide  $\frac{2}{3}$  by 2 instead of  $\frac{3}{4}$ , the result, we know, is  $\frac{1}{3}$ . But the divisor 2 is three times bigger than the actual divisor  $\frac{3}{4}$ . Therefore, our result will be 3 times too small. Hence, to get the right result we must multiply  $\frac{1}{3}$  by 3; which gives us  $1\frac{1}{3}$ . Now,  $\frac{2}{3} \times \frac{3}{4}$  also makes  $1\frac{1}{3}$ . Therefore, if we multiply  $\frac{2}{3}$  by  $\frac{3}{4}$  we get the same result as if we divide  $\frac{2}{3}$  by  $\frac{3}{4}$ . Or, to divide by a fraction, turn the fraction upside down and multiply in the ordinary way.

#### EXAMPLES

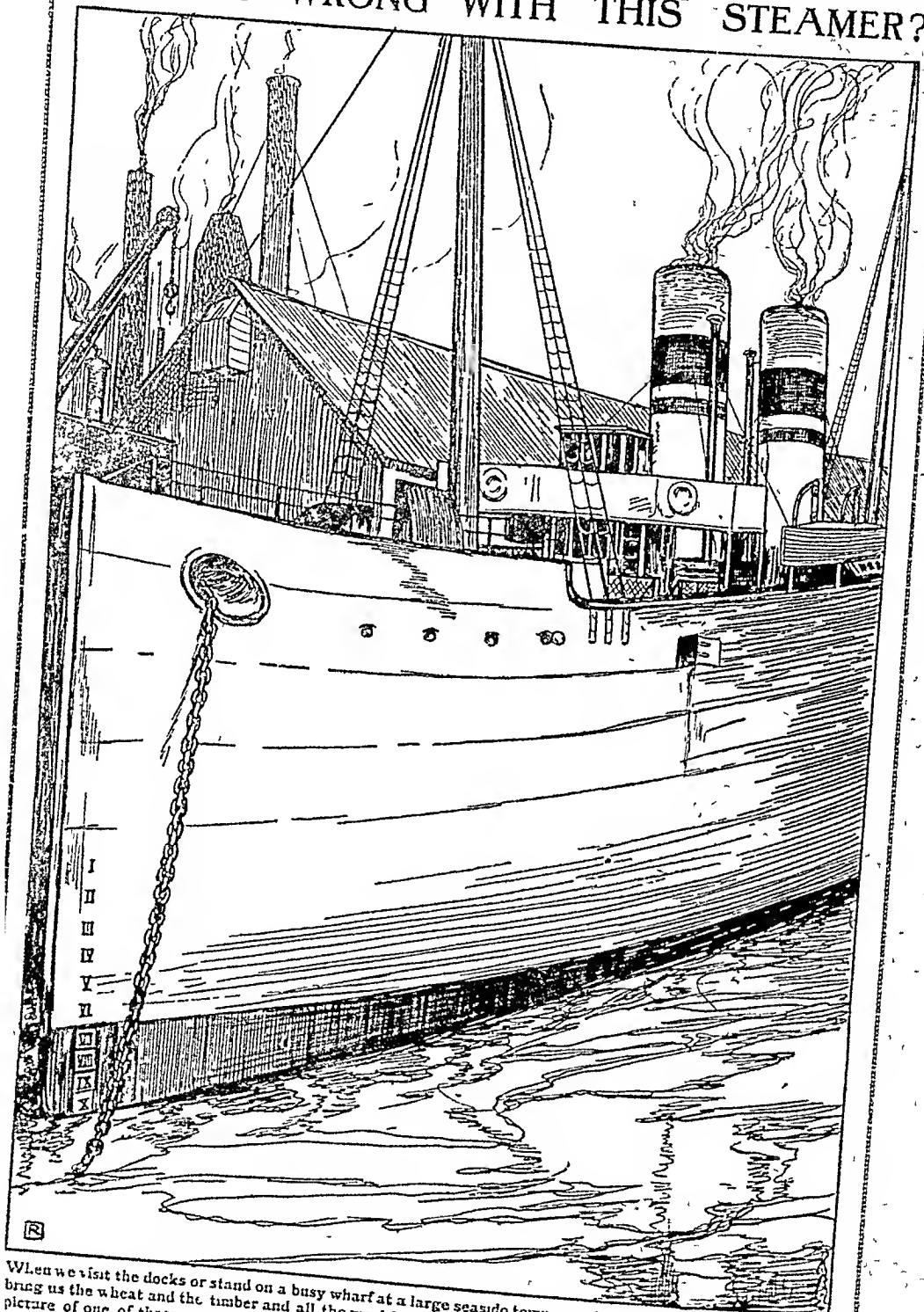
(1) Divide  $\frac{2}{3}$  by  $1\frac{1}{2}$ . Here we express the divisor as an improper fraction  $\frac{3}{2}$ . Inverting this, we have to multiply by  $\frac{2}{3}$ . The result is  $\frac{4}{9}$ .

(2)  $2\frac{3}{4} \div 2\frac{1}{2} = \frac{21}{8} \div \frac{5}{2} = \frac{21}{8} \times \frac{2}{5} = \frac{21}{20}$  Here, after inverting the divisor, we cancel by 4 and by 7, and obtain  $1\frac{1}{20}$ , or  $1\frac{1}{20}$ .

### A FRENCH LESSON IN PICTURE THE NAMES OF FAMILIAR OBJECTS IN THE COUNTRY

[illegible]

# WHAT IS WRONG WITH THIS STEAMER?



When we visit the docks or stand on a busy wharf at a large seaside town, we often gaze at the great ships that bring us the wheat and the timber and all the wealth of the world for use in all parts of the country. Here is a picture of one of these great steamers, and in making his drawing the artist has made at least ten mistakes. Can we find out where he is wrong? We can compare our list with that given on page 3616 of this book.



## THINGS TO MAKE AND THINGS TO DO



# HOW TO PRESERVE REAL FLOWERS

WHEN we look at all the gay flowers in the garden during the summer we feel sorry that they will last only such a short time. A clever German has discovered a way by means of which real flowers may be preserved in their natural colours and these will last a good many months without fading. It is not very difficult to deal with flowers in this way and if the directions are carefully followed one is almost certain to meet with success.

In order to preserve the flowers a large and rather shallow box should be obtained. We shall not want the lid, and even the bottom must be knocked out, so that we have a kind of frame. Across the inside of the frame nail a piece of wire acting with the mesh about the same as that used for rabbit hutches. This is fixed in its place instead of the bottom of the box in order to give a support to the flowers, which we shall put in presently, and yet to allow the air which will dry the blossoms, to come freely through. We next get a board which is quite flat and large enough for the frame to stand on, leaving a little space all round. The only thing that is now required is a quantity of a finer sand and this can be

kind is much more easily preserved than others and it will be found that roses, asters

and chrysanthemums are especially good. In a general way white flowers are not so successful as the petals are a tinge to turn rather a dirty yellow in colour. Pinks and crimsons are perhaps the best colours of all though one cannot well discover those which will answer the purpose without trying them. The flowers must be quite dry and free from rain or dew and is perfect as possible.

We place the frame on its end of wood with the wire netting downwards. First of all we put a thin layer of the clean sand inside and after this place the flowers on the wire netting, spreading the petals with our fingers. It is now time to cover in the flowers with a layer of sand, and this should be put on very evenly. In the case of some flowers it is a good plan to turn the heads upwards before covering in with sand. Supposing the flower is bell-shaped, such as a tulip, the insides must be filled with the sand. When the flowers are quite covered in the box should be kept enough, our measure of blossoms may be arranged. As a rule it is not a good plan to have more than 10 layers of flowers in each box.

The frame containing the dried flowers may now be removed and it should be placed in a warm, dry place. Of course the bottom part must be taken with it, as the sand will fall out. A good plan is to use the frame in an shed in a sunny green house where the crumpled process can gain quickly or to hang the flowers in a warm kitchen.

After about ten days we may take a peep at our flowers by just pushing away a little of the sand if the blossoms feel dry and dry for time has come to take them out. Supposing, however, that they are not ready to be taken out, we must wait a little longer. When they are ready to be taken out, we must wait a little longer. When they are ready to be taken out, we must wait a little longer. When they are ready to be taken out, we must wait a little longer.

# HOW TO MAKE SWEETS AT HOME

WE are all fond of sweets, but perhaps some of us have never tried to make our own. Many kinds of sweets are so simple to make, and give such little trouble, that we may like to try some of these recipes.

## BURNT ALMONDS

Dissolve 1 lb of Demerara sugar in a teacupful of water, and stir this in a pan over the fire until it comes to the boil. Cease stirring for two or three minutes, then add  $\frac{1}{2}$  lb of blanched almonds, and stir quickly until the sugar browns and coats them. Turn them on to a wire sieve to cool, dividing any that may have become joined together.

## PEPPERMINT CREAMS

Mix in a basin 3 ozs of arrowroot with three gills of cold water until smooth. Put this into a lined saucepan with 1 lb of white sifted sugar, and keep stirring it. Let it boil for ten minutes, then move the saucepan off the fire, but stir the contents till cool. Flavour with a few drops of peppermint essence. Take up lumps of the mixture, roll them into little balls, and put them on a slab of marble that has been buttered slightly to prevent sticking. When cold, roll the creams in icing sugar. These sweets are also made by flavouring fondant mixture with peppermint.

## CREAM FONDANTS

Put into a pan on the fire 2 lb of granulated sugar, and pour on to it a small teacupful of hot water. Allow this to boil about eight minutes, or till it thickens, but on no account stir it. To test it, take up a little on a new wooden skewer. It a thread forms on taking a drop between the thumb and first finger and separating them, pour the mixture into a bowl and, while warm, beat it with a wooden spoon till creamy. As it cools flavour it with vanilla, raspberry, or some other essence, and colour half of it pink with cochineal. The sweet is then ready.

## CHOCOLATE CREAMS

Take some of the fondant mixture and roll it into balls with the hands. Place the balls on a sheet of oiled paper and leave it for twenty-four hours. Cut up about a quarter of a pound of some unsweetened chocolate and soften it in a pan standing in another one of boiling water. Add to the chocolate two table-spoonfuls of water and 2 ozs of icing sugar, and stir it smooth. A tiny lump of butter and a few drops of cream improve the chocolate. Drop the fondant balls into it, get them out with the aid of a fork, and lay them on paper to cool and dry.

## COCO-NUT BALLS

Put into a pan and boil, unstirred,  $\frac{1}{2}$  lb of castor sugar and three-quarters of a small teacupful of water until a few drops crackle when dropped into cold water from the end of a wooden skewer. Now stir in 1 oz of desiccated coco-nut. Take lumps of the mixture and roll them into little balls.

## BARLEY SUGAR

Put into a pan and boil 1 lb of loaf sugar, a small teacupful and a half of water, and a tiny pinch of cream of tartar. Test it by

dipping in a wooden skewer and plunging this in cold water. If the sugar is brittle, it is ready for the addition of the juice of a quarter of a lemon and a little saffron colouring. Let it boil to 300° F by the thermometer, pour it on to a sweet-oiled marble slab, and cut it into strips with scissors. Twist these and store them in glass bottles.

## VANILLA CARAMELS

Boil over the fire in an aluminium or tinned saucepan, stirring frequently, 1 lb of loaf sugar, three dessert-spoonfuls of glucose, and a small teacupful of water. Test it by dropping a little into cold water. If it hardens, add one gill of cream and  $\frac{1}{2}$  oz. of butter. Boil again, stirring frequently, till a little turns brittle on being dropped into cold water, then flavour with vanilla essence and pour the caramel on to a tin or oiled marble slab. Cut it into convenient squares and wrap them neatly in oiled paper.

## NOUGAT

Blanch and chop coarse  $\frac{1}{2}$  lb of almonds and dry them in the oven. Put  $\frac{1}{2}$  lb of castor sugar with one dessert-spoonful of lemon-juice into a pan, and stir it with a wooden spoon till it colours slightly. Drop in the almonds. Pour the nougat on to a marble slab, press it into cubes or mark it in squares with a knife dipped in hot water, and break them up when cold.

## TURKISH DELIGHT

Melt 1 oz. of gelatine in a teacupful of cold water, and put this into a saucepan with 1 lb of castor sugar and the juice of an orange and a lemon. Boil it up three times and then simmer it about twenty minutes till sticky. Butter a soup plate and pour half the mixture into it. Colour the remainder with a few drops of cochineal, pour it on to the rest, and set it to stiffen. Then warm the plate slightly to loosen it, turn it on to paper dusted with icing sugar, cut it into squares, and sugar these also. Store it in a tin.

## MARZIPAN POTATOES

Prepare some marzipan as described in making Easter eggs, on page 2975, or mix half a pound each of castor sugar and ground almonds with the white of one egg, beaten stiff and flavoured with essence of almonds. Shape pieces into the form of new potatoes, punching dents for the "eyes" with a skewer. Roll the potatoes in cocoa essence in order to coat them brown.

## MARZIPAN FRUITS AND NUTS

Strawberries, cherries, mushrooms, dates, and walnuts can be made with marzipan. The hulls of the strawberries are cut out of green crinkled paper, the stalks of the cherries of twists of paper or green-covered wire. The marzipan is shaped and rolled in sugar coloured with cochineal and placed on paper to harden.

Real fruit may be halved and marzipan placed between the halves. A mushroom is shaped by flattening a lump of marzipan in the hand and hollowing

a centre for the stalk. Dust the under side with cocoa essence. Roll some marzipan for the stalk, and dip one end in white of egg to make it stick in the hole. If the white part looks too yellow moisten the surface with white of egg and dust it with sifted sugar.

A flattened lump of marzipan can be inserted between the two halves of a dried walnut or replace the stone of a date.

Acorns in cups and numbers of delicious bonbons can be devised out of marzipan.

# MARSH MALLOW

Dissolve 2 ozs. of gum arabic in one gill of cold water. Warm and strain it into a pan over a fire with 4 ozs. of icing sugar stirring constantly till a little forms a ball when dropped into cold water. Remove the pan, add one and a half whites of eggs previously beaten stiff. Flavour with caramel essence. Stir and turn mixture on to a tin pan laid with icing sugar to set for twelve hours. Cut into cubes and dust these with icing sugar.

## THE GAME OF STICKERCHIEF

A SLENDON game that can be played by any number of children is Stickerchief. It is quite as exciting as hockey or lawn tennis, and it has the advantage of not requiring expensive balls, racquets or sticks.

Stickerchief is played with a handkerchief and some short pieces of bamboo of the sort used by gardeners to hold up trill flowers. A dozen of these bamboos can be bought at any florist's for one shilling.

The game can be played on a lawn of any size, and the grass will not be injured as it is not necessary to make any white lines on it. We have only to make two goals, one at each end of the lawn and these will merely be formed by the flower sticks stuck into the grass about four feet apart. When we have placed two sticks at each end of the lawn in this way we can begin.

It is best to make the first attempt with only two players. Each must have one of the light bamboo sticks and they must stand

the handkerchief. Then they have a fine struggle for it. Sometimes the handkerchief flies off the stick while the player is running with it and then the other player can often catch it before it reaches the ground. Sometimes it is skillfully knocked off and sometimes neatly lifted off. Any way is considered fair, the game is won by the player who gets the handkerchief through the opponent's goal and to prevent him from scoring. A game is finished when a goal is scored. A match consists of five games, and the player who wins the largest number of games is the victor.

After a little practice any number of children can play together. Two captains are chosen and these captains pick the players who are to form the teams. Four, six or even ten players may be in each team, in fact the only limit is the size of the lawn.

When all are ready and have been picked with the sticks the captain tells the players where they are to stand—some close to the



The game of stickerchief as played by a boy and girl

in the centre of the lawn between the two goals. Now they must place a handkerchief in the ground and stand on opposite sides of it with the ends of the sticks just touching the ground, about a foot away from the handkerchief as we see in the picture.

Then one player must count. One—two—three—four! and at the word 'four' both must try to pick up the handkerchief on the sticks. It is much more difficult than it looks. Each player tries to knock his opponent's stick away.

Presently one manages to pick up the handkerchief, and when this has been done he can throw it into the opponent's goal. If, of course, the other player manages to knock it off before it gets to the goal, the player who has picked it up must try to get it on to his own goal before he has thrown it to the other goal.

In a few minutes both players become thoroughly excited. The first player who

goal, and others near the middle of the lawn. Then the captains take their places by the handkerchief, and start the game at the word 'Go'.

Of course it becomes very exciting more each time when a player has picked up the handkerchief and is going to throw it into the goal, and when it is thrown into the goal the other side can score a goal.

If there are many players on each side it is difficult to be distinguished as some may think they can be distinguished as some may think it is a good idea to have a few of children in the line of each team. One side can be green boys and the other team. These are picked out and are let come and see that they cannot win on the other.

The game is a very good one for all ages and is played by boys and girls of all ages. It is a very good game for all ages and is played by boys and girls of all ages. It is a very good game for all ages and is played by boys and girls of all ages.

# A LITTLE VEGETABLE GARDEN

## WHAT TO DO IN THE MIDDLE OF JUNE

THERE is time now to look round and enjoy the sight of the rapid growth of all that we have planted. Yet we may not be idle. The tomatoes that we planted in the warmest corner we could find will need careful watering, and it is not enough to pinch out the side shoots once or twice—we must go on pinching them out as they appear.

The stems of the potatoes have grown considerably since we made our first earthing-up of the soil around them, so we may now earth-up higher than was possible at first.

If the soil be very dry where the peas are growing we must water them frequently, or put a top dressing of stable manure over the surface of the soil round about them. A top dressing of littersy manure both in the flower garden and in the vegetable garden is often used. It is best applied after rain while the soil is moist, in this state the top dressing will prove a valuable means of keeping the moisture in the soil and preventing evaporation when the sun is hot upon it. Another means is to use the hoe frequently, and we have already learned how this was effectual—the moisture is lost more quickly when the tiny atoms of soil lie close together than when they are loose.

We must remember that it is not well to pull our rhubarb too closely, for each stem pulled the plant loses a great leaf, and if too many be pulled the loss is felt unduly. Now that gooseberries are in season for cooking, we should give our rhubarb a little rest, or, at any rate, pull sparingly for a time, later on, in a month or less, according to the weather, we may begin to pull again, for a juicy second crop of young stems will have grown up. Many people prefer to wait for this second crop before making rhubarb jam.

As the lettuces, or, in fact, any crops, become ready for use, make no long tarrying before beginning to use them. To wait till the whole crop becomes ready to be eaten is a fatal mistake. Rather begin to pull too soon than too late. It is a well-known fact that the more peas we pick the more we shall be able to pick, for if we relieve the plants of the many pods they bear as soon as these pods are ready for use, the plant has sufficient strength immediately to produce fresh pods. With other crops—lettuces, for

instance—if we do not begin to use them as soon as we should, some of the plants will run away to seed before we can eat them.

When broad beans are in full bloom, the tips of the plants may with advantage be removed.

If we have some raspberry-canies, it is a good thing to put a top dressing over the soil in which they are growing. This dressing may consist of littersy stable manure, but if this is not to be obtained, use a sprinkling of the mown grass, or some half-decayed leaf mould, the main thing is to give the canes all the moisture that is in the soil, and therefore, by this top dressing, to prevent evaporation.

In the flower garden we have now all our summer plants in their places, and if everything is not as neat and trim as it can possibly be made, no time should be lost in putting it in order. Perhaps we have plants that we have been growing in pots—our fuchsias and geraniums and others. These may well be planted out for the summer. The geraniums should have the sunniest place we can find, and it is better not to water them very frequently if we want plenty of blossom. Abundance of moisture will give us large plants with large leaves, but very few flowers. The geranium has a great deal of moisture in itself, the green stems are soft and juicy, and such plants are better kept rather dry. They come to us from South Africa, and are able to bear a hotter sun than we have in England.

If we have a greenhouse, we have probably that beautiful rose, *Maréchal Niel*, in it. It flowers under glass earlier than roses grown out of doors, and needs pruning at a different time—when it has finished flowering.

If we have the care of a greenhouse as well as of a little garden, we are bound to think of how we are to stock it. Now is the time to sow cineraria seed. The best way is to sow the seed in pots or pans, which should be kept covered with a piece of glass until the seedlings appear. We must stake our dahlias and other plants as soon as they need it. The stakes must be planted firmly in the soil.

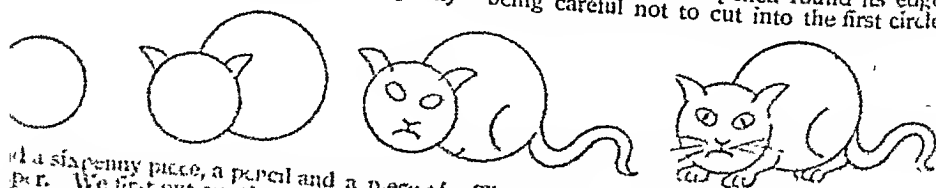
Any ferns or other hardy plants, or rose-trees that have been planted during the spring, will need more care and more frequent watering than plants that have been established all through the winter and have become hardened.

## DRAWING A CAT WITH

THE four little pictures shown here prove to us how very simple a thing it is to make amusing drawings. We need a threepenny

## THE AID OF TWO COINS

place our sixpence to the right, overlapping slightly, and run our pencil round its edge, being careful not to cut into the first circle.



and a sixpenny piece, a pencil and a piece of paper. We first put our threepenny piece on the paper and draw a circle round it, then we

The ears, eyes, nose, mouth, tail, and two curves for hip and elbow, are then inserted, and a few more strokes complete our pussy.

# HOW THE TELEGRAPH TALKS

## A SIMPLE EXPLANATION OF THE MORSE CODE

How do people manage to send words over a wire when they send a telegram or a cablegram? How does a telegram tell us that there has been an earthquake in Messina or in San Francisco reach London in words conveying the information?

As a matter of fact, the telegraph wire does not convey words at all. It makes a needle, made something like the pointer on the dial of an old-fashioned barometer wag backwards and forwards. That is all. But the man who is working the machine at one end of the telegraph line can make the needle of the machine at the other end of the line no matter how far off it may be wag exactly as he wants it to do.

How this result is achieved we may see at another time. Meantime it must be enough for us to know that it is so and by the system of sending and interpreting signs known as the *Morse code* the man or operator at the receiving end of the telegraph line can put into words the signs sent by the man at the other end of the wire.

### WHAT IS THE MORSE CODE?

Now what is the Morse code? It is only a system of calling the letters of the alphabet by names different from those given at school. For instance, dot dash stands for the letter A. But we do not, when we use the Morse code write the word "codash" we simply make a dot and a dash like this — so that the sign — stands for A.

Now there is nothing particularly exciting in this, indeed, it looks forbidding. But we shall see presently that the Morse code may be made very useful. For instance we can use it in quite a few different ways. We write secret letters, and we can use it for signalling—say with the arms or with a handkerchief, so that two boys can whisper on different sides of the street, from different corners of the playground or from different sides of a hillside may be able to converse together by signs. Well, here is the Morse code.

A —	I —	R —
B —	J —	S —
C —	K —	T —
Ch —	L —	U —
D —	M —	V —
E —	N —	W —
F —	O —	X —
G —	P —	Y —
H —	Q —	Z —

We should also remember that the sign for "none dot—dash" means "No" and the sign for "dash—dash" means "Yes" and "Yes".

Now, it is not so hard as it looks to send a message by telegraph. We can make a good deal more of it than we can in the form of a rhyme. But we must be able to send a message by telegraph. We can also send a message by telegraph. We can also send a message by telegraph.

purposes of amusement and play, but it may also perform a real service for us in future years in the serious business of life.

### MORSE IN METRE

When you want simply A make a dot and a dash

One dash and three dots give you B in a flash

Dash dot dash and dot are the signal for C

Four dashes are for Ch dash and two dots

are D

One dot stands for E, or means No, you

will not

And for F you make two dots, a dash, and

a dot

Two dashes and one dot add G to your store

Four dots are the H careless speakers ignore

Two dots are for I (Morse's I's are twice

dotted)

One dot and three dashes to J are all used

One dash, dot and dash give you K when

you smell

And a dot, dash and two dots are equal to L

It's a couple of dashes a dash and

dot

But for O put three dashes—three strokes of

your pen

It's a pair of plain dots with two dashes

between

Two dashes, dot, dash—if it's Q that you

mean

R's a dot, dash and a dot add three dots to

an S

And a dash by itself stands for T or for

Yes

Two dots and a dash is how U now makes

a U

Three dots and one dash for a V have to do

With U and two dashes can make a perfect

Make a dash and two dots and a dash—d if

there's X

Dash dot and two dashes as Y will be read

And two dashes with two dots behind them

are Z

Now we have a system, however simple it

may seem, which will enable us to send a

message by telegraph. We can also send a

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# MAKING A HOT-AIR BALLOON

Almost everyone has seen the big paper balloons that are sent up at firework displays. Generally they are made to carry coloured lights, so that when the balloons fly away they can be seen until they rise to such a height that they look like tiny stars in the sky. These balloons are made of tissue paper and they are not filled with gas but with hot air. It is quite easy to make one.

At any stationer's shop we can buy large sheets of tissue-paper. It is best to buy a

quire which will cost about sixpence, and, if possible, we should get two colours. Then we can make our balloon with coloured stripes. When we have got the paper we must lay it all out flat on a table. Then, with a soft pencil we can draw on the top sheet the shape shown in picture 1 but as large as possible on the paper that we have. When we have marked the shape we can fold the first sheet down the centre from top to bottom. This will show us if the two sides of the shape we have drawn are the

same. If they are we can cut round the pencil lines with a pair of scissors. This first sheet will now form a pattern for all the others. We should lay it over them and cut very carefully through the remaining twenty-three sheets with the scissors, so as to make them all exactly the same size as the first one. We now have to stick them all together very firmly.

We first take a white piece and lay it flat. Then place over it a red or blue piece so that on one side a little of the white shows. Put another white and another coloured one over them in the same way, always leaving a little of the edge of each sheet showing. Picture 2 shows clearly how this must be done.

We next brush some thick gum over the edges. In this we can gum five or six pieces of the same line, and do it much more neatly than if we do it each quite separately.

When the gum has been spread smoothly we take it all up and lay it on the table to the right-hand side of the sheet before the same thing is done with the next sheet. When the first and the last sheet are done we have a paper which we can expect to be as well as the first. Then we take a small piece of gum and stick it to the bottom of the first sheet and the

When the gum has dried we must put the nose of a pair of bellows into the opening at the bottom and blow air in gently. In a few minutes our balloon will expand and we can see if all the edges have stuck properly. If they have not, we must put on a little more gum because of course the balloon must be air tight.

We must now measure the opening at the bottom and with a piece of thick wire make a ring that will just fit into it. We fix one

piece of wire across the centre of the ring, as shown in picture 2 and in the middle of this straight piece put a little tuft of cotton wool.

Now we very gently fix the ring into the opening, fold the edge of the paper over it and gum the folded part down firmly. Our balloon is now quite finished as we see it in picture 3. Taking it out into the garden we choose a place sheltered from the wind and then pour a little methylated spirit on the cotton wool, being very careful not to let any of the spirit get on to the

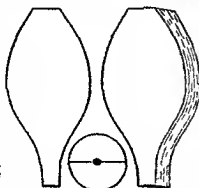
paper. When it is all ready we should get somebody to hold the balloon up for us while we put a match to the cotton-wool. We must do this very very carefully because everything depends upon this moment. If the little flame from the spirit touches the

tissue-paper it will, of course, burn a hole in it. In a few minutes the hot air will make the balloon expand and it is nicely rounded out. Holding it until it looks quite full we then gently let it go. It will rise very quickly into the air and will go to a great height before we shall have plenty of paper left and can make another at once. If we used the heat lamp instead of the

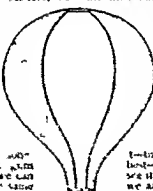
spirit lamp we could keep it burning for a long time and we should see it as long as the light burns. If we are very good we can make a very fine paper balloon and

the whole secret of it is to be very careful and to be very quick. It is to choose a suitable day, to be very quick and to be very careful.

There is no secret in it, but it is a little tricky and it is a little tricky. It is a little tricky and it is a little tricky.

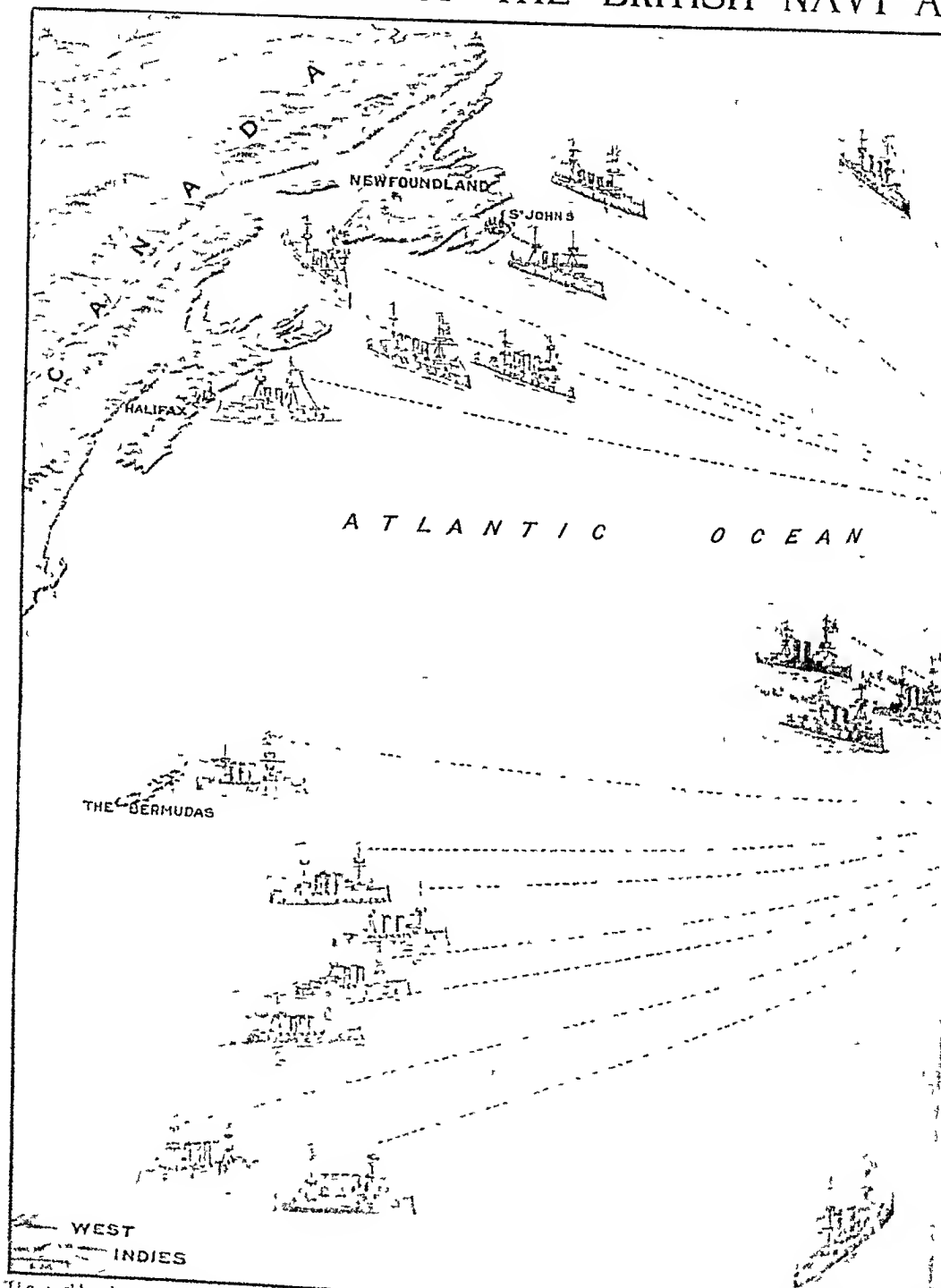


1. Pencil shape cut out. 2. Wire and cotton wool for gumming.



3. The completed balloon.

# HOW THE SHIPS OF THE BRITISH NAVY A

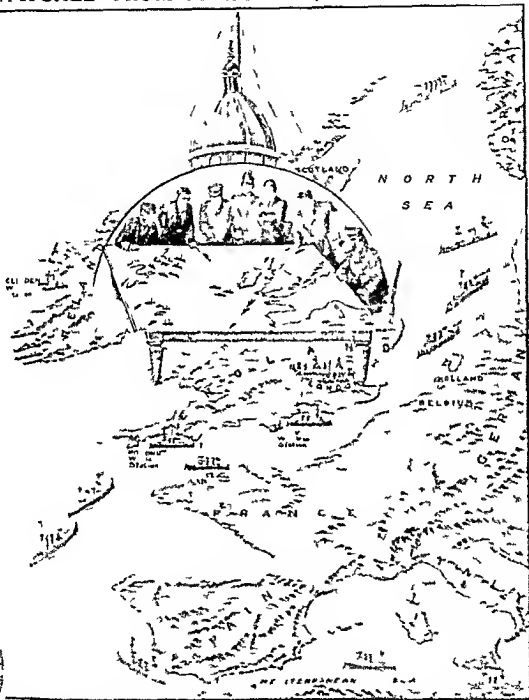


The world is becoming a more wonderful place to live in every day. We can speak to people hundreds of miles away. We can send messages round the world in less than five minutes. In this picture, the artist has tried to show one of the greatest marvels that the mind of man has yet achieved. Upon the dome of the new Admiralty Office in Whitehall is a mysterious entanglement of wires which have puzzled many passers by. These wires are part of one of the great wonders of our time, they can that men can sit in a little room in London and talk with ships as often as the wind miles away. It is wire's telegraph that has made it possible for messages to sit under the dome in Whitehall and watch over his flock of sheep at the other end of the world. At the other end of the world, the ships of the British Navy are at sea. Arranged on the map, the ships themselves are like the sheep of a flock. At the other end of the world, the ships of the British Navy are at sea. Arranged on the map, the ships themselves are like the sheep of a flock. At the other end of the world, the ships of the British Navy are at sea. Arranged on the map, the ships themselves are like the sheep of a flock.

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# WATCHED FROM A TABLE 1,500 MILES AWAY



...and then. The ... of the ...  
 ... take as ... and ...  
 ... and ... of C ...  
 ... the ... the ...  
 ... in ... the ...  
 ... of ... the ...  
 ... All ... the ...  
 ... the ... the ...  
 ... the ... the ...  
 ... the ... the ...

...and then. The ... of the ...  
 ... take as ... and ...  
 ... and ... of C ...  
 ... the ... the ...  
 ... in ... the ...  
 ... of ... the ...  
 ... All ... the ...  
 ... the ... the ...  
 ... the ... the ...  
 ... the ... the ...



# The Child's Book of FAMILIAR THINGS

## POST OFFICE TELEGRAPHS



If the Receiver of an inland telegram desires the message to be sent by registered post, he must so indicate on the message, and the message will be sent by registered post. If the Receiver of an international telegram desires the message to be sent by registered post, he must so indicate on the message, and the message will be sent by registered post. If the Receiver of an international telegram desires the message to be sent by registered post, he must so indicate on the message, and the message will be sent by registered post.



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TO The Readers of the Children's Encyclopedia  
 Thank you for all your letters about  
 our book. I hope you will all have  
 very happy ones  
 The Editor

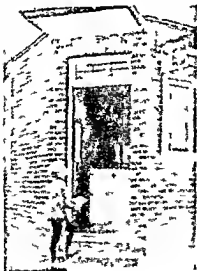
## HOW WE SEND A TELEGRAM

NOBODY can say what electricity really is. It is not matter. It cannot be seen though its effects can. It cannot be smelt or tasted. We call it a fluid because we cannot give it a better name. But though we do not know what it is we know how to bring it into use, how to create or excite it, how to harness it and make it our most marvellous and obedient servant and one of the chief wonders electricity performs for us takes place after we hand a telegram across the counter of a post office. A telegram is one of the familiar things in our lives which are really so wonderful that no man can quite understand them.

If we wish to send a telegram say from London to York we must have in the post-office a battery from which we can send electricity along wires. The wires coil round a piece of iron and so long as the current of electricity is passing through the coil there is a magnet called an electro-magnet as

it. The moment the current ceases the iron is no longer a magnet. We see a picture of this electro-magnet and battery on page 54. When we send the electricity through this coil we call it magnetizing the coil. The current flies swiftly along the wire and while it is going the circuit is said to be closed. When the current ceases the circuit is broken.

Now we hand our telegram for York to the telegraph operator. Before him there is a little lever with a knob at the end. This lever is called a key. While that key is at rest the circuit is broken. The moment he presses it down the circuit is closed and the current races along the telegraph wire. He then moves the key and the current ceases. He then writes the letters of the telegram on a strip of paper. If it is a long telegram he writes it in groups of five letters each. We must all the while be waiting for the message to come. This is the end of the first part of the message.



TAKING A TELEGRAM

receiving it. We must all the while be waiting for the message to come. This is the end of the first part of the message.

from London. It enters the office by the wire. It passes through the coil and makes the iron magnetic. The magnet attracts towards itself a little metal bar working on a lever, and every time this bar comes down towards the magnet, the end of it taps upon a small screw, then when it goes up again it taps on another screw. Each tap that it makes corresponds with something that the clerk in London has done at his end of the wire.

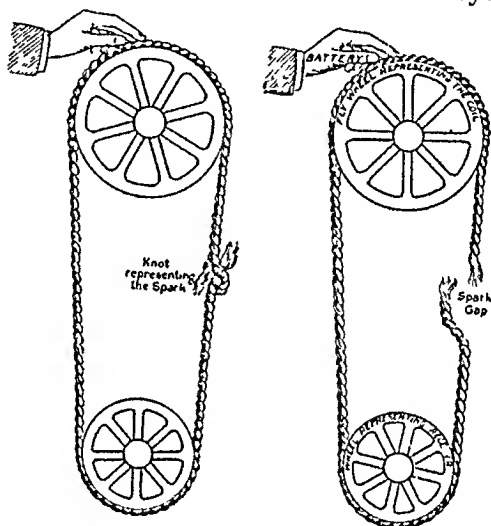
The London clerk, as we have seen, presses down a key. That key, when at rest, has its knob raised in the air. There is a wire attached to the key. Now, when the key is pressed down, its under side touches another wire. The pressing down of the key joins these two wires together. That closes the circuit. The joining of the two wires instantly causes a current of electricity to flow from the London battery over the wire to York. The instant that the key is allowed to rise from the wire underneath it, the current is stopped, and the circuit is broken. While the current is flowing, the coil and iron at York become a magnet, that draws towards itself the small metal bar.

Clever men thought out a way of making this of use. They arranged that certain pressures by the sending key should stand for certain letters. We have only to agree once for all that a certain sign shall stand for a certain thing, and then we know what it means. And that is how we got the telegraph's A, B, C. A very short pressure of the key in London gives two taps at York, one very quickly after the other, and a longer pressure gives two taps, but with a longer interval between them. These double tappings, one with a short interval between the taps, and the other with a longer pause,

correspond with the dots and dashes of the Morse alphabet, which we see on the opposite page, and about which we read on page 3515.

When we send our telegram from London to York, the telegraph operator turns the letters which we have written into telegraphic letters by tapping away at his key in the manner agreed upon. Each tap is registered at York instantly it is made. With each pressure upon the key the circuit is closed, and the current flies for a certain length of time, signifying a sign which means part of a letter. Each time the key is at rest in its ordinary position, the current ceases to flow.

But there is a limit to the speed at which a man can tap his key. If he is very skilful and strong he may be able to send as many as forty words a minute. More likely he will not be able to send more than twenty-five. That is not quick enough when the message which he sends, instead of being a little telegram from one of ourselves, is



This diagram explains the uses of the battery, coil, and wires in the sending of a telegram. The hand stands for the battery, which provides the energy. The big wheel represents the coil, which regulates the electric current to flow as we want it. The rope represents the flow of the current, conveying the energy to the small wheel, which stands for the receiving end. The knot is for the electric spark, which ties the ends of the rope, or current, together, as it were. When the knot is tied, the circuit is closed. When the knot is untied, the circuit is broken. It is the rapid tying and breaking of the spark-knot that produces the electric waves

among, say, ten clerks, each of whom sits before a machine that punches holes in a ribbon of paper, the holes corresponding to the letters of the Morse alphabet. Each clerk punches 120 words of the message, at the rate of 25 words a minute, so that, when the work is divided in this way, the whole message is punched out on the tape, or ribbon, in about five minutes. The ribbon is then run through an elaborate telegraph instrument, called an automatic transmitter, because it works itself. The ribbon runs through in such a manner that the

## HOW WE SEND A TELEGRAM

circuit is closed at each hole in the paper representing a dot or a dash and the current flows along the line to be registered at the other end in ink upon a tape. By this machine message can be sent at the rate of 400 words a minute. The recording of the dots and dashes upon a tape at the receiving end is necessary because no clerk could write out the message at the rapid rate at which it is received. The writing out is done from the printed dots and dashes on the receiving tape.

We do not find this recording instrument in small post offices. The instrument which is used in railway signal boxes and stations is what we call the needle instrument. There we find a little dial in front of which a needle works to right or left according as dots or dashes are meant. By watching this the operator can take a message quite easily. But as the needle moves to right and left it strikes upon two little bars of metal each different from the other so that they give out different sounds and by listening without watching the clerk is soon able to read the message by sound just as the clerk in the post offices do with their improved instruments.

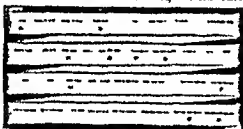
Perhaps the greatest wonder of the telegraph line is the fact that several messages can be sent at the same time. Two messages can be travelling over one wire at the same time from London to York while two others are coming at the same time over the same wire from York to London. This is done by arranging different strengths of current. The messages that are travelling together from the north to the north are each sent by a current which is of different strength from that of the other and the same is the case with the messages from the north. Each current goes to a receiver which takes a current of particular strength.

If we have five messages away over the sea to which we may wish to telegraph, we can send the five a

message carried by electricity under the sea. Cables run under the Atlantic and Pacific Ocean and the Mediterranean Sea the Black Sea the Indian Ocean the North Sea the English Channel, and so forth. There are about 250,000 miles of these submarine cables in use so that we can exchange messages with America Canada Australia New Zealand India China and every other civilised country. The principle is the same as in the land telegraph but the wires are different and the rate of telegraphing is slower as the current passing through these long wires is necessarily weaker which makes the recording of the messages received a slower operation.

If the ordinary telegraph wires were used the current would run off into the sea and be lost. So the wires have to be encased in gutta-percha and bound round with tape and varn and brass and tarred hemp and over all are wound coils of stout wire to protect the cable from the sea and the rocks at the bottom of the ocean. For long distances only one wire is placed in the cable but for shorter ones many can be used. More than one message can be sent over the cable at the same time.

The speed at which cablegrams can travel is very great though we have not yet the instruments to receive the messages quickly. A signal has been sent 8,000 miles under water in a single second. But we could not send a long message at this rate. At present a single



These dots and dashes are the telegraph's A, B, C. The dot and one dash, made by the operator tapping his key, stand for the letter A, and so on, and there are other combinations for figures. In some systems of telegraphing the code is not a series of dots and dashes on a strip of paper-tape, as it is in a code in a machine. The dots and dashes are made by a key.

Not many years ago at an International Exhibition a message was sent from London to the United States to Canada from Canada to London to Portugal from Portugal to London.

A word to cable across the Atlantic codes are used by which one word may mean a dozen or more words. By this means time and money are saved. Three or four hundred words can be sent in that manner. For instance, the word 'London' may mean a dozen or more words. By this means time and money are saved. Three or four hundred words can be sent in that manner. For instance, the word 'London' may mean a dozen or more words. By this means time and money are saved. Three or four hundred words can be sent in that manner.

India, and Japan. It went back by the same route, and was received in the same room from which it had started, but at another instrument. It had been round the world in fifty minutes.

Undoubtedly the most wonderful method of telegraphing is that without wires. We get some idea of how it is done from the story about the telephone, on page 59. It was known for some years that electric waves are carried through the air in all directions, with the speed of light, and this knowledge has been turned to useful purposes.

By the use of an instrument called a transmitter, these electric waves can be sent bounding forth through the air in all directions. By making a receiver in tune with the transmitter, we can make that receiver take a message. To receive the message an instrument called a coherer is used. A coherer is a glass tube, sealed at both ends with metal, and filled with metal filings. When an electric wave comes along, it passes through this tube. It magnetises the metal filings, and causes them to draw close together—to cohere, and to close the circuit. The wave is quickly gone, the filings are no longer magnetised, and the circuit is then broken again.

The coherer receives a light tap from a little automatic tapper, and the filings fall apart again instantly, to be as they were before, ready to receive the next electric wave. When the metal filings come together and close the circuit, they operate a bell or sounder, like the simple instrument in the country post-office, and the message which they tick is read and written down, ready to be sent to the person for whom it is intended.

Thus, we send a message thousands of miles across the ocean without the help of wires. Here again the rate is slow. Cablegrams run off at the rate of fifty words a minute, but the wireless telegrams go at the rate of only twenty-five words a minute. Some day, of course, this pace will be greatly

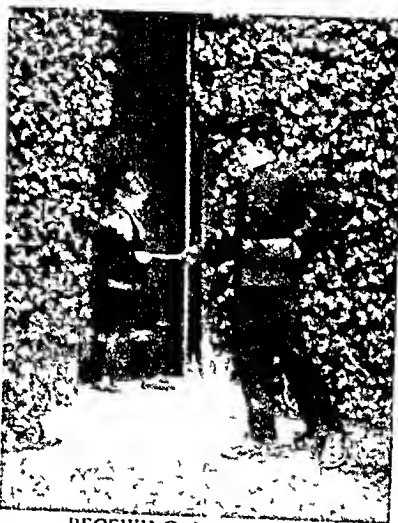
improved. Wireless telegraphy is one of the great gifts that inventors have given to mankind, and we cannot yet realise the importance of it to the world. The pictures on these pages show how wonderful is the power that wireless telegraphy gives us to speak across the sea, and only a few months before these words were written there happened a wonderful thing, showing how the power of telegraphy without wires may save great disasters at sea. Let us read the story of how a man tapping away into space saved a thousand lives.

Let us picture to ourselves an immense liner moving slowly from its berth. The quay is crowded with people waving their hands and fluttering handkerchiefs. From the side of the ship, on all the decks, leans a multitude of passengers waving farewell. The space between these two crowds slowly widens. Between ship and shore flows an increasing space of troubled water. The faces of people become indistinct. The sounds die away. Then the engines get to work, and the great ship moves forward, and draws impressively to sea.

The passengers hurry to their cabins. They see that everything is comfortable for them. They put on great coats and wraps, and take to

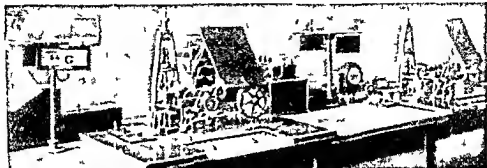
the decks. Before they begin to walk about, however, they think of their families ashore, their wives, husbands, children, sweethearts. They go to one of the rooms on the ship and write messages of affection and good cheer. They ring a bell. A servant comes, and the messages are handed to him. They are carried to the clerk in charge of the wireless telegraph. The passengers begin to walk about the liner and to enjoy themselves.

In his little room the clerk of the wireless telegraph sits before his machine. On the table in front of him are the messages of passengers, a pile of crowded papers. It is the business of the clerk to send those messages. He flips an A, B, C into the ether, and somehow or another those letters are

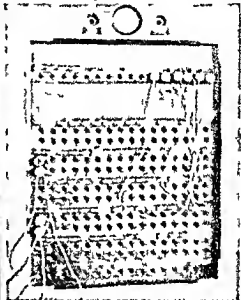
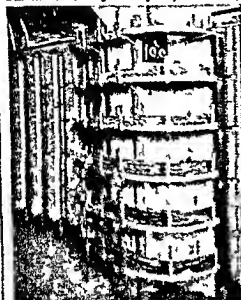


RECEIVING A TELEGRAM

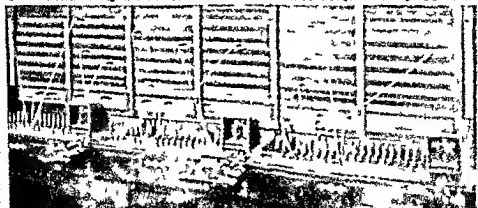
# THE CENTRE OF A MILLION MESSAGES



This shows the wonderful instrument by which messages are sent from London to Berlin, either 10 or 40 words a minute. The sending is done by a keyboard like a piano, and the machine prints the words at the other end.

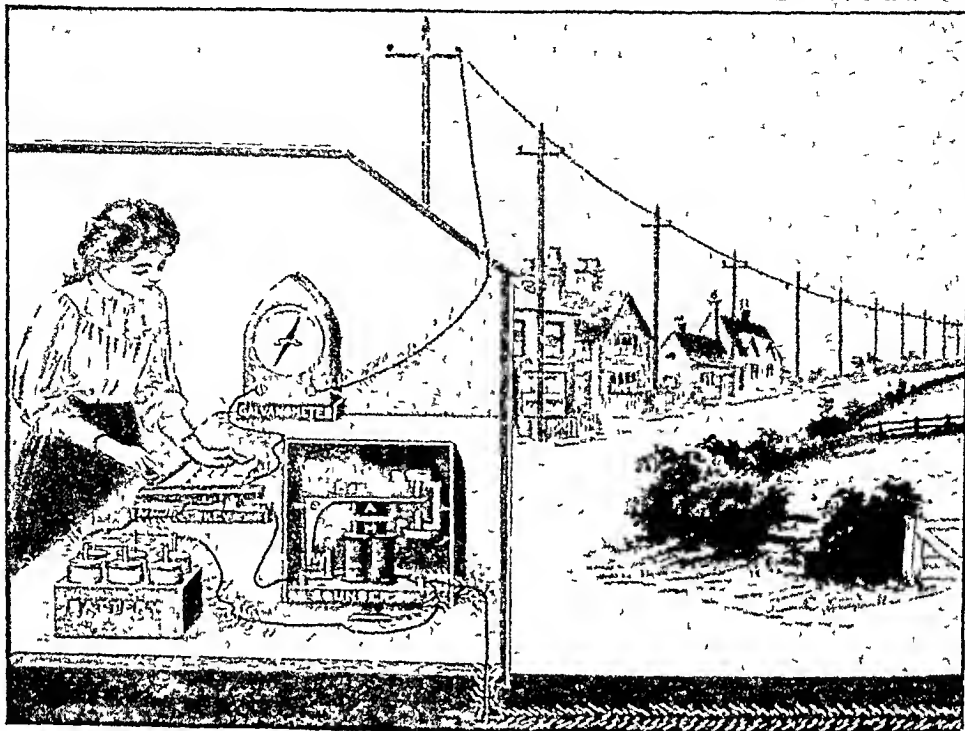


There are about 5,000 wires in the Central Telegraph Office. Each one and every wire is tested from time to time to see that it is in working condition. On the left we see the wires all connected, and on the right is a test box.



This is one of the men working at the Central Telegraph Office, London, who work on the wires carrying up on Greater London. They work at all times of day and have a continuous knowledge.

# THE TELEGRAM STARTS ON ITS WAY



In the left corner we see the interior of a telegraph office. The girl is sending a telegram to the office shown on the next page, hundreds of miles away. Each time she presses down the key with her right hand, a current runs from the battery, through the key, which connects the two wires, through the galvanometer and out over the wires to the far-away town.

received on shore. They travel without wings, without wires, they arrive.

A fog descends upon the sea, the engines are slowed, the foghorn begins to sound.

Tap, tap, says the operator, earning his daily bread.

*Crash!*

A noise like thunder. A shock that sends everything flying. A tearing and rending and splintering of timbers. A dull, thudding crumple of steel plates. The roar of water rushing in. The staggering shudder of the whole ship. Shrieks and cries of people from every quarter. Voices shouting through the fog—loud voices of command. And darkness. Every electric light goes out.

The operator interrupts a sweet-heart's message, and taps out the letters C, Q, D. Through the cries of the passengers, above the shouts of command, piercing the black fog and winging wingless over the ocean, those invisible letters strike on the "receiver" ashore, and on numerous "receivers" aboard other ships, almost

at the moment when the operator sets them free. They mean to those who receive them. "In serious trouble need immediate help."

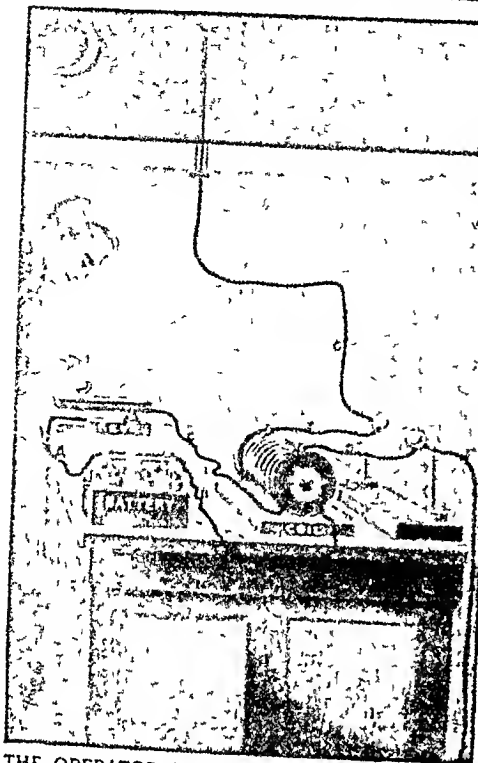
What has happened? The steamer Florida has rammed the great White Star liner Republic. The water pours in, the pack of panic-stricken humanity waits for death.

Through it all the operator sits amid the ruin of his office, tapping, tapping, tapping his messages into space.

On another vessel, in another little office, another clerk sits tapping away at the ether. The telegraph operator on the Baltic was sending his passengers' messages home when his receiver recorded the distress call from the Republic. The sinking ship was sixty miles away, drifting in a dense fog, and the Baltic changed its course and set out to find it. From half-past seven in the morning till half-past six at night the Baltic scoured the sea, talking all day long to the ship that was sinking with a thousand lives. All day long on the sinking ship sat the telegraph operator,



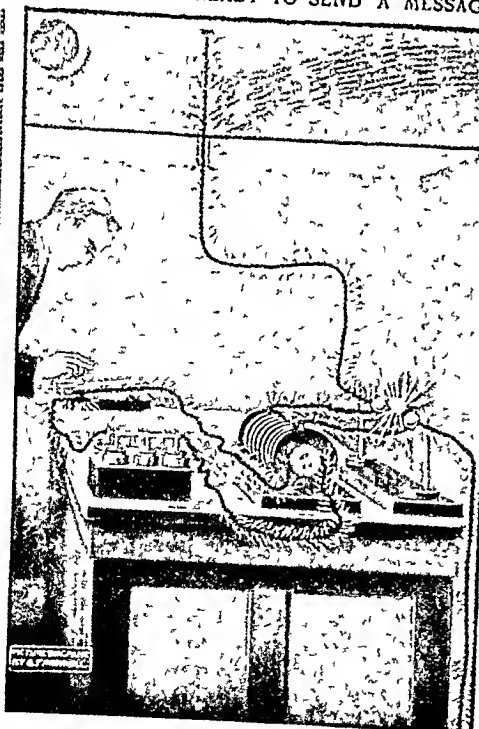
# THE UNSEEN TELEGRAPH MESSENGER



THE OPERATOR READY TO SEND A MESSAGE

## SENDING A "WIRELESS" TELEGRAM

Here we see the operator preparing to send a telegram without wires. There is the key, which he is to tap, the battery, which gives the current necessary for sending the message, and the induction coil. At a little distance from the coil we see two brass knobs. One of the knobs is connected to a wire, *r*, which runs down into the earth. The other knob is connected to a wire, *g*, which goes out into the air. So long as the key remains untapped, that is to say so long as the ends of the wires have a little space of air between them, just underneath the knob, the current cannot flow along the wires. The telegraph instrument, without the touch of the operator's hand, is as silent as an unplayed piano. But suddenly an urgent message has to be despatched. The operator presses down the knob of his key. Immediately the current leaps across from the wire *a* to the wire *c*, and along this to the coil. It whirls round miles and miles of wire in the coil, gathering intensity at every whirl, then out, along *r*, to the brass knob -



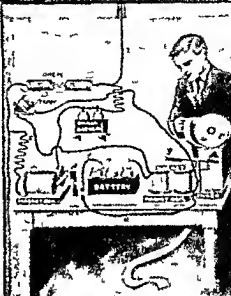
MAKING THE ELECTRIC CIRCUIT

The current from *L* charges the little brass knob powerfully with electric energy; the other knob is also charged from the coil along *b*, the electric charge gathers in the knobs until it becomes so powerful that the air between them is unable to keep it apart, and it leaps across the space with a loud crack and brilliant spark; this sends a shock along the wire *r* down into the earth, and also up the wire *g* out into space in every direction, as we see on page 3531. The electric current is shown as sparks of light in this picture, but it cannot really be seen. For a dot of the alphabet a single spark jumps from knob to knob. For a dash there is a little stream of sparks. What else happens we cannot see, but we know all the same. When the key is tapped and the spark ends, the message actually begins. Waves are set up in the ether, carrying each dot and dash of our message. Such is the power of electricity working in conjunction with the wonderful ether, an element that not one of us can explain any more than we can explain the electricity itself.

# TURNING ELECTRIC WAVES INTO WORDS

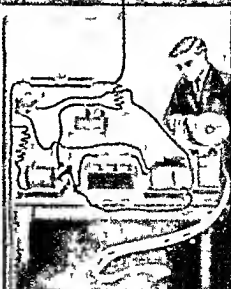
## RECEIVING A "WIRELESS" TELEGRAM

Here is the office in which the wireless telegram is to be received. The sender whom we see on the opposite page may be thousand of miles away but the receiving instruments here are in tune with his. The waves which he caused after travelling for thousands of miles over the ocean at last reach in about one-sixteenth of a second the wire *a*. Through this they pass to the coherer shown large in this picture for clearness. It is a little glass tube in which are two silver plugs. Between these there is a little space which is occupied by loose grains of nickel and silver. The incoming wave causes the filings to cohere or join together as we see in the lower picture. The message through a now flows across and through *b* and *c* to the magnet coil. It magnetises the piece of iron marked *magnet* which attracts the upright piece *d* and this enables the message to pass to the wires *e* and *f* which now form a powerful circuit working another magnet which also attracts another piece of iron marked *e*.



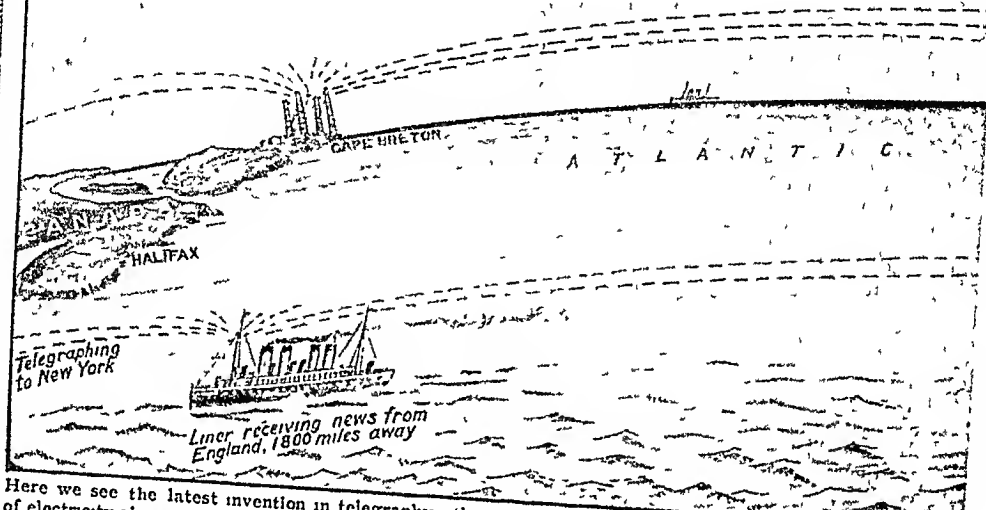
OPERATOR ABOUT TO RECEIVE A MESSAGE

Every time the piece of iron marked *e* is attracted by the magnet it lifts up an ink at the other end which spells out the message in dots and dashes on a paper revolving on a wheel by clockwork. The lower part receives the signs that spell out the message and the upper part being inked on to the wheel. The current must be broken several times for each word and each dot or dash otherwise we could not get our message. This is effected by the instrument called the 'interrupter' which breaks the current marked *g* and *h* into a series of pulses. The upper part of the instrument is the 'interrupter' and the lower part is the 'magnet' which attracts the piece of iron marked *e* and causes it to move up and down. The current marked *g* and *h* is the 'battery' which provides the power for the entire system. The 'magnet' is connected to the 'battery' and the 'interrupter' is connected to the 'magnet'.

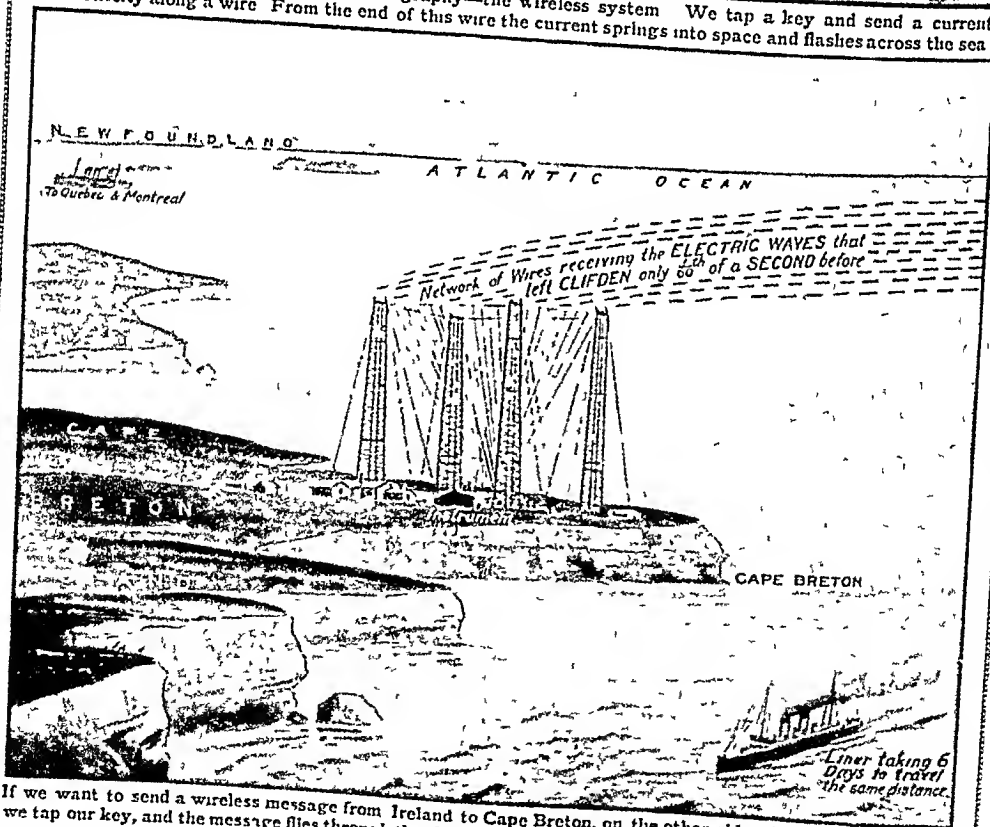


OPERATOR ABOUT TO RECEIVE A MESSAGE

# MESSAGES THAT FLY THROUGH SPACE

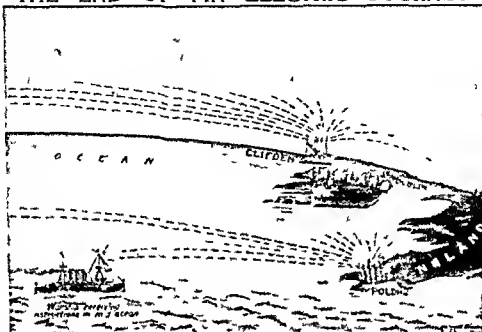


Here we see the latest invention in telegraphy—the wireless system. We tap a key and send a current of electricity along a wire. From the end of this wire the current springs into space and flashes across the sea.



If we want to send a wireless message from Ireland to Cape Breton, on the other side of the Atlantic Ocean, we tap our key, and the message flies through the air, covering the 2 000 miles journey in the sixtieth of a second.

# THE END OF AN ELECTRIC JOURNEY

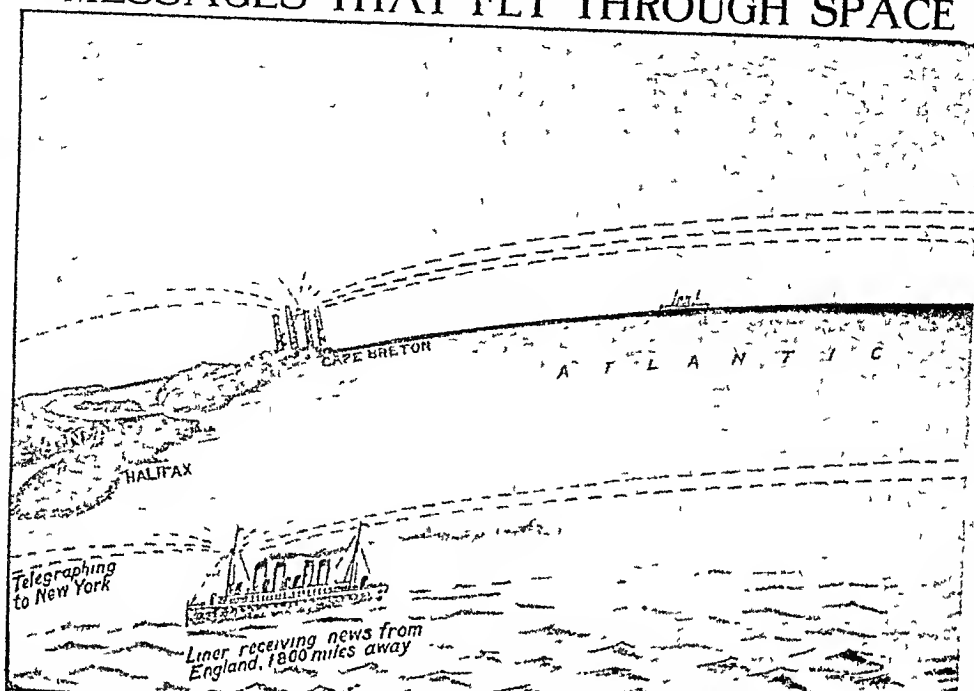


Not only can we send a message from the Irish or English station we can receive a message from the ship. We get news for some body on the shore we can send it to the ship and the ship can send it to the shore.

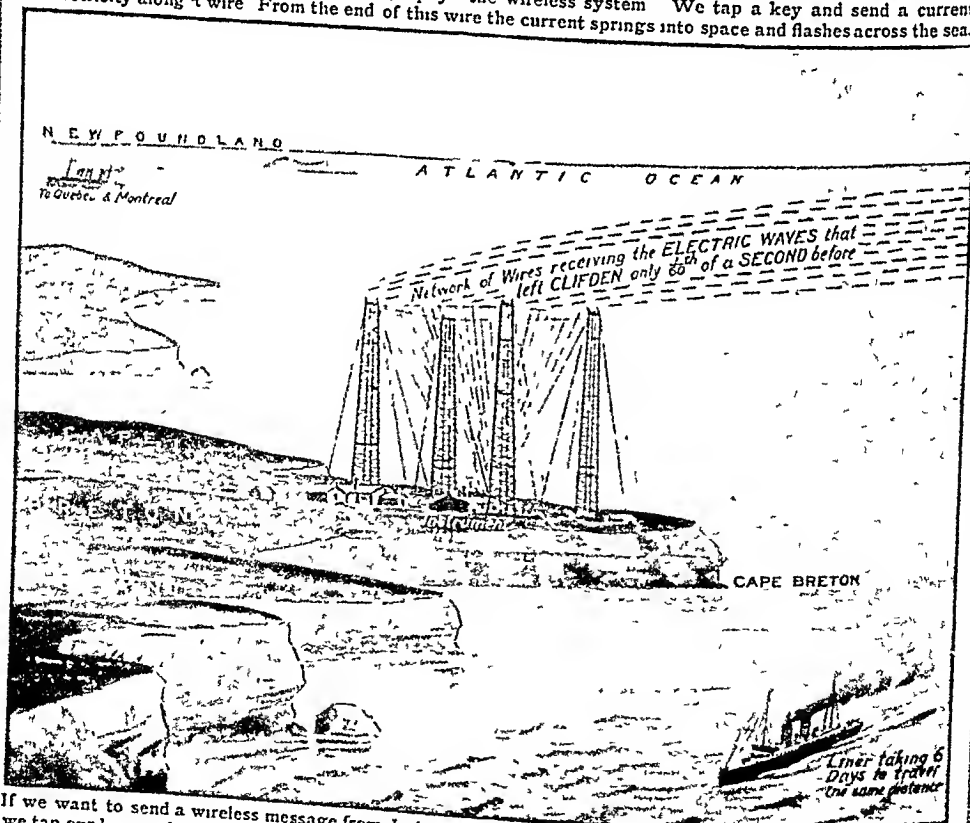


(Of course, though we use a wireless telegraph, we have found that the ship can be reached.)

# MESSAGES THAT FLY THROUGH SPACE

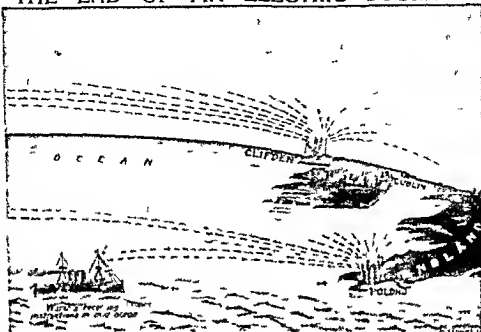


Here we see the latest invention in telegraphy—the wireless system. We tap a key and send a current of electricity along a wire. From the end of this wire the current springs into space and flashes across the sea.

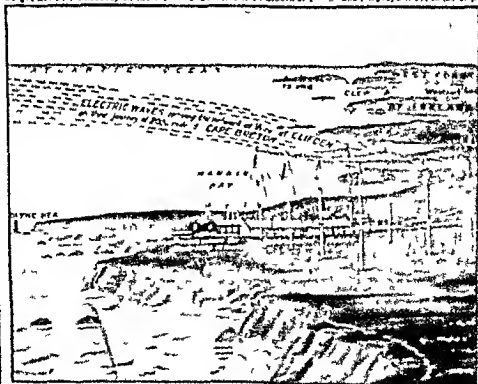


If we want to send a wireless message from Ireland to Cape Breton, on the other side of the Atlantic Ocean, we tap our key, and the message flies through the air, covering the 2 000 miles journey in the sixtieth of a second.

THE END OF AN ELECTRIC JOURNEY



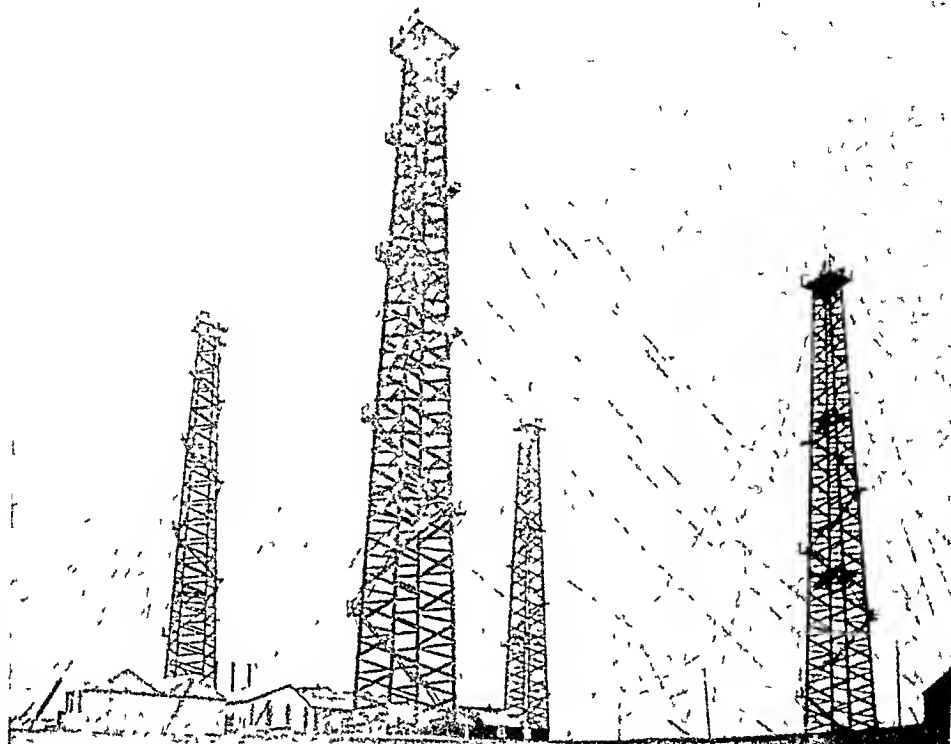
Not only can we send a radio gram from the Irish or English station we can even message a telegram. If we get news from somebody on the radio we can receive it at Clifton or Port and we can put it out in the afternoon.



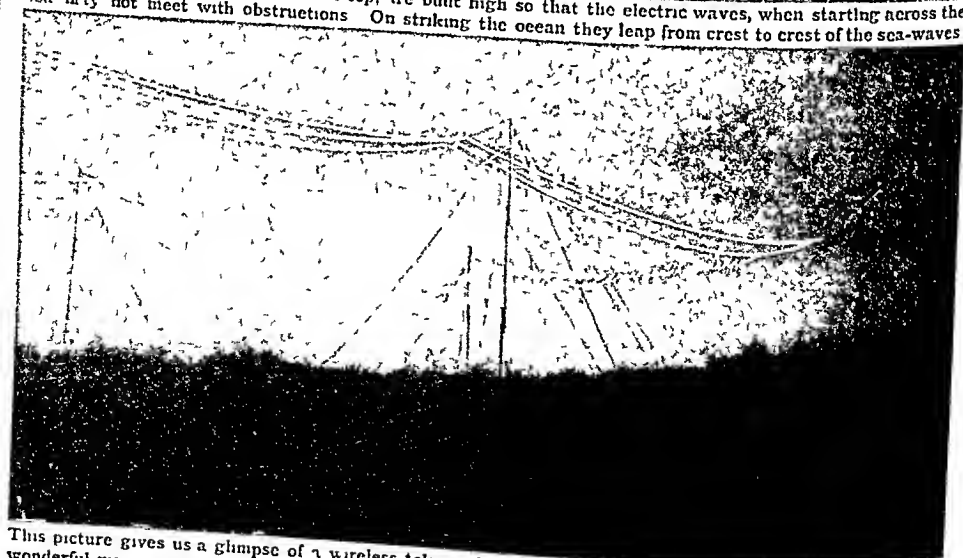
Of course, though we are  
not a secret lab

to be left in the water for 24 hours and then to be  
left in the water for 24 hours and then to be

# A WIRELESS STATION' BY DAY AND NIGHT

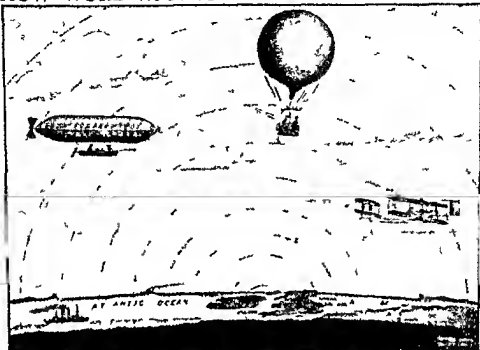


The structures, with the wires at the top, are built high so that the electric waves, when starting across the sea may not meet with obstructions. On striking the ocean they leap from crest to crest of the sea-waves



This picture gives us a glimpse of a wireless telegraphy station by night. Whether it be light or dark, the wonderful waves created by the power of electricity speed on their way across the waters. Receiving instruments are ready to record their message, and the words fly, in dots and dashes, speedy as light, and as noiseless

# HOW WORD-WAVES TRAVEL EVERYWHERE



This picture shows a diagram the wonderful way in which the electric shock travel through the ether. The wireless waves radiate in all directions outwards and upward, so that in less than a second a dot of the message shown here being sent from Palmyra, could be received in London, New York, America or on any ship sailing on the Atlantic Ocean. It is so prompt everyone receiving anyone else's message that the instant they are tossed. The message could also be received in an airplane between stations and of others above the clouds of men could get there. It is also proved that they descend into the earth.



This picture shows us in another way that we can observe how the wireless waves travel repeating nearly in true circles. The boy has thrown a stone into the pool and it is now far away. As the boy's finger and thumb the further they get from the spot where it was thrown. The waves are in waves to the other very like those we see with the stones. It is very interesting to see how travel may be in a horizontal direction. I found that at a short distance the waves were to be very small, and in 15 minutes. A better knowledge of how these electric waves travel is provided by the light from a lamp or candle. The light-waves travel from the lamp in every direction and in waves so as to go through the world in exactly the same way from the center of which it comes to every part.



# THE WOMEN AT THE EMPTY SEPULCHRE



The scene at the empty tomb on the first Easter morning, as painted by two famous artists. In the upper picture, an angel appears to the women who brought sweet spices, and below, Jesus is appearing to Mary Magdalene. The upper picture is by Axel Ender, reproduced here by permission of Messrs. Hecker & Sons and the lower one is by Sir L. Burne Jones.



with a glove of mail, twisted and plaited them into the shape of a crown. A third brought a reed to act as a sceptre. Here, in those things, lay the trappings of a king. The old and faded robe was thrust upon the stricken body. The crown of thorns was pressed over the dishevelled hair till it pierced the moist brows. The reed was placed in the right hand. Then they crowded about Him, laughing and mocking, calling "Hail, King of the Jews!" and making obeisance to Him.

Some have said, in later records, that Pontius Pilate saw Him in this piteous guise, and, moved by the spectacle, had Him brought out to the Jews again, as though to make them ashamed of killing such a poor king. He pointed to Jesus and said "Behold your king!" But the Jews cried with renewed rage "Away with Him! Crucify Him! Crucify Him!"

Before such a storm of hatred and priestly rage, Pilate was powerless. He turned from the shrieking crowd and from the mock-king at his side, and gave orders for the death of Jesus. With his own hand, it is said, he wrote the mocking superscription to be nailed on the Cross "Jesus of Nazareth, the King of the Jews." These are the only words written by the great Roman that have descended to posterity.

#### JESUS IS STRIPPED OF HIS ROBE AND LED AWAY TO BE CRUCIFIED

The mockery was now at an end, Jesus was stripped of the purple robe, clad in His own garments, and led away to be crucified. There were two thieves to be punished with death on this day, and a procession was formed, with Jesus and the two thieves carrying the crosses on which they were to die. But the weight was too great for those gentle shoulders, and Jesus stumbled under it. A man named Simon, from Cyrene, was among the people watching the procession. He was strong and powerful. The Roman soldiers bade him come forward and carry the Cross of Jesus. Perhaps it was with the smile of a strong man that he came slowly forward, lifted the heavy burden to his shoulder, and marched beside Jesus, proud only to display his strength before his friends. But that action, of which he perhaps thought so little, has immortalised his name. He walked with Jesus to Calvary.

At the place of death, Jesus was offered a cup of wine mixed with myrrh, a draught which stupefied the senses, so that the agony of crucifixion was not felt so keenly. He rejected it. Weak and broken though He was, so weak that He could not carry His Cross, He yet refused the merciful draught which minimised the agony of death. For that agony, strength of limb was not necessary. His beautiful soul was able to bear it.

#### THE MOCKERY OF JESUS AS HE HUNG UPON THE CROSS

The Cross was laid upon the ground. The body of Jesus was stretched upon it, fastened by cords at the wrists and ankles. Then the hands were extended, and, through the palms, long nails were driven deep into the wood. Afterwards, nails were driven through the feet, resting on a block of wood projecting from the horizontal beam. Then the heavy Cross, with its sacred burden, was raised from the earth, carried a little way, and dropped into the hole prepared for it in the ground. While the soldiers busily trampled stones and earth into this hole, the Cross swaying as they did so, there stood by, a company of Jews crying out to the agonised Jesus: "Ah! Thou that destroyest the temple and buildest it in three days, save Thyself, and come down from the Cross!" The priests who stood by said "He saved others; Himself He cannot save!"

The crosses of the thieves were raised and jolted into the ground on each side of Jesus. Tortured by their pains, the thieves joined in the blasphemy, though St. Luke tells us that one of them later repented and rebuked his fellow-criminal. "We receive the due reward of our deeds," he exclaimed; "but this man hath done nothing amiss." Jesus hung there silent and majestic in His awful pain.

#### THE ROMAN SOLDIER WHO STOOD AT THE CROSS WAITING FOR THE END

St. Mark, the earliest recorder of this tragedy, tells us that, afar from the Cross, there stood certain women who had followed Jesus, who had done Him service, and to whom He had given His Divine peace. These women, standing distant from the Cross, were the only members of that multitude which had loved and followed Him. Near Him, so close to Him that He could hear their voices, were His enemies, mocking the

## THE MOURNERS AFTER CALVARY



Ever thoughtful of others Je us, in His agony on the Cross, commended His sorrowing mother to the care of the disciple whom He loved, and here we see John tenderly leading the bereaved Mary to his own home.



At the time of the sorrowing and disappointed disciples were journeying to Emmaus on the day of the resurrection, Jesus drew near and joined them, but they knew Him not. Although He spoke to them of all things which had happened, they knew Him not. He then broke bread and blessed it, and they knew Him.

throes of His agony with pious taunts and religious sarcasms Jesus perished in a terrible loneliness. Perhaps the one man moved by the sublime dignity of Christ upon the Cross was the Roman centurion standing in front of it, waiting for the end.

Over that scene there fell gradually a darkness such as we experience even in the midst of summer, and as this darkness deepened with the creeping hours, Jesus, silent till now, lifted up His voice and cried aloud "My God! My God! Why hast Thou forsaken Me?"

Someone, more pitiful than the rest, filled a sponge with vinegar and lifted it to the lips of Jesus on a reed. But Jesus uttered a cry, bowed His head, and died.

One exclamation was heard at that moment the involuntary admiration of the Roman centurion "Truly," he cried, "this man was the Son of God."

That evening, a noble Jew, named Joseph of Arimathea, presented himself before Pilate and asked permission to bury the body of Jesus in his garden. Pilate was amazed to learn that Jesus was already dead, and questioned the Roman centurion. When he was assured, he gave permission to Joseph.

#### THE NOBLE JEW WHO LAID THE BODY OF JESUS IN HIS GARDEN

The priests did not need that wounded body. The dead Jesus was no menace. With His death their hatred ended. It was only a feeling of reverence that inspired the noble Joseph to make his request. He had known Jesus, had been impressed by His character and struck by His teaching. His heart revolted from the thought of the barbarities and insults which the mob might possibly practise on the body. While all the disciples were still far away, this chivalrous Jew drew near to the Cross of shame.

He wrapped the dead body of Jesus in fine linen, and laid Him in a sepulchre that was hewn out of a rock, in his garden. To save the body from insult, he rolled a mighty stone before the door.

The faithful women who, from a distance, and with what anguish we can well imagine, had watched the crucifixion and the death of Jesus and who had seen Jesus taken from the Cross and laid in the tomb by Joseph of Arimathea, afterwards returned to the dwelling-place and prepared spices and ointments for embalming the body.

They were convinced that He was dead. Whatever He might have said to them about His victory over death they knew now that death had closed those gentle eyes and sealed those tender lips. From afar they had watched. If they had entertained some wild hope that this gracious Friend would step down from the Cross and subdue the power of Rome, that hope must have dwindled as the hours passed, and must have expired with the cry of Jesus out of the darkness, and with the bowing of His head.

#### THE FAITHFUL WOMEN WHO REMAINED TRUE TO THE MEMORY OF JESUS

Christ had failed them at the last. He had dreamed in vain. But their love for Him was not destroyed. No, with the tender loyalty and the gentle reverence of womanly affection, they returned sorrowfully to their home to render the last service possible to the Teacher they had so often hailed as Master. They would embalm His dead body.

On Friday night, they toiled at the preparation of precious ointment and sweet-smelling spices. For these women, we may be sure, the death upon the Cross was the end. Life now could only contain memories of that Divine presence, recollections of words and phrases He had uttered, the haunting sense of His personality—these things would be all that remained of the dead Master.

On the following day, Saturday, the Jew's Sabbath, these faithful women rested, according to the law. How that day must have passed in sacred memories! The hush of the house, the heat of the day, the idleness and repose which lengthened out the hours—can we not see that little home?

#### THE WOMEN DRAW NEAR TO THE TOMB AND FIND A STRANGER THERE

They rose at daybreak on Sunday, the first day of the week, and, carrying their ointment and spices, hastened from the house through the streets of the still sleeping city towards the garden of the noble Joseph. They feared the observation of priestly spies; they walked quickly, their ointment and spices hidden beneath their cloaks, anxious to avoid both friends and enemies. In the secrecy of Joseph's garden, and with his permission, they would perform the loving service of embalming the body of the Master, and then return unnoticed to their homes.

We can imagine the scents of the garden as they entered from the street and saw the bushes and flowers beaded with dew and heard the singing of birds from trees which threw soft shadows on the grass.

As they drew near the creper-clad rock out of which the sepulchre was hewn they saw that the stone was rolled away and imagined that Joseph had risen already and had made this preparation for them. They entered into the chilled sepulchre and advanced through the shadows but the body of Jesus was not there. They stood still their eyes searching each other's faces.

[At this point the original Gospel of St Mark ends. The verses 9-13 of the last chapter it is thought were added by a later writer. We will therefore take leave of our guide and follow the narrative in St Luke.]

Words spoken by Jesus came him  
to the women with a new meaning  
as they hurried from the tomb. With  
ever quickening steps perking in low  
and astonished voices among them  
selves this little company of pious  
women left the garden and hastened  
through the streets to a house where  
they would find the apostles.  
When they entered breathless and



St. Matthew tells with some justification that it was a good man, he brings back the thirty pieces of silver and says, "The Lord is with you, and you are with the Lord." He is the one who had the priest and when Judas saw the man, he took it and bought a burial place for strangers.

What had happen? Who had taken the body away? With sudden terror they were about to leave the sepulchre when they beheld a young man on the right side clothed in a long white garment. The women were afraid. The young man said gently. Be not affrighted. Ye seek Jesus of Nazareth which was crucified? He is risen. He is not here. This is the place where they laid Him. Then ye go ye away tell His disciples and Peter this. He goeth before you into Galilee. There shall ye see Him as He said unto you. The women were filled with astonishment and did not think to ask him questions. They fled away trembling and afraid.

excited with the amazing narrative  
the sorrowful and inspiring story, ex-  
thought that it was not a lie.

But I never over the night, and I  
champion, member of the little tea  
rose, under the water, can  
from the house, the little  
Stooge, down St. Luk, the  
been here, later, the  
had for themselves, and started  
down at what had come to be

The day after I finished the  
work I was and knew what  
to do. As I was with the  
to it I was sure of it and  
and was sure of it.

100-19411-2472-132

They told that they were walking out from Jerusalem to Emmaus when they fell in with a stranger who inquired why they walked so sadly and spoke so earnestly. One of them replied

"Art thou only a stranger in Jerusalem, and hast not known the things which are come to pass there in these days?"

And the stranger said "What things?"

They answered "Concerning Jesus of Nazareth," and they told the tragic story of His death

**THE STRANGER ON THE ROAD TO EMMAUS AND THE TALK BY THE WAY**

Then the stranger rebuked them and said "Ought not Christ to have suffered these things?" and He spoke of prophecies concerning the Messiah

At Emmaus He would have left them, but they had derived hope from His words, and constrained Him to stay with them, saying "Abide with us, for it is toward evening, and the day is far spent"

Then He yielded and entered into the house with them, and as they sat at meat He took bread and blessed it, and gave it to them, and as they received it from His hands they saw that the stranger was Christ Himself. But, as this recognition came, the vision faded from their sight, and they were left alone

"Did not our heart burn within us while He talked with us by the way, and while He opened the Scriptures?" they exclaimed to each other, and immediately they rose up and hastened with all speed back to Jerusalem

While the disciples listened to this strange narrative—the wonder and the hope increasing—suddenly they perceived that Jesus Himself stood in the midst of them. Jesus—their crucified Master! Jesus, their Lord, their Shepherd, and their Friend!

**THE APPEARANCE TO THE DISCIPLES ON THE THIRD DAY**

"Peace be unto you," was the blessing breathed from those gentle lips

But the disciples were terrified and affrighted. They believed that they looked upon a ghost

"Why are ye troubled?" Jesus inquired of them. "Why do thoughts arise in your hearts? Behold My hands and My feet, that it is I Myself, handle Me, and see, for a spirit hath not flesh and bones, as ye see Me have."

He looked upon the terrified group of men, showing them His scarred hands and His wounded feet, but they could not believe. Joy—too deep a joy for expression, a joy hitherto unknown in all the ages of the world—prevented these men from believing

Then Christ asked: "Have ye here any meat?" and, unbelieving, they set before Him a piece of fish and some honey. Then He did eat before them, and as they watched Him, He said

"These are the words which I spake unto you while I was yet with you, that all things must be fulfilled which were written in the law of Moses, and in the prophets, and in the Psalms concerning Me." Then He spoke to them of the visions of prophets and poets concerning the Christ that was to come. "Thus it is written, and thus it behoved Christ to suffer, and to rise from the dead the third day, and that repentance and remission of sins should be preached in His name among all nations, beginning at Jerusalem. And ye are witnesses of these things. And behold I send the promise of My Father upon you, but tarry ye in the city of Jerusalem, until ye be endued with power from on high"

**THE WALK THROUGH THE COUNTRYSIDE TO BETHANY**

Then He led the wondering disciples from the room, and together they walked as far as Bethany, the village He had loved. There He blessed them, and as He bent above those kneeling figures, laying His hands upon their heads, and speaking words of peace, He was parted from them, and they saw Him no more

There, in the open countryside of Bethany, the first Christian service was celebrated. The still kneeling disciples lifted up their eyes to heaven, and worshipped the risen Christ.

Then they returned to Jerusalem, their hearts beating with joy, their spirits exalted with delight. Christ was risen! Christ was risen! Henceforth, one passion alone possessed them, one intense and unequalled generosity devoted them—to spread this new-found joy among the children of Israel

Such joy had entered into them as was never known hitherto to men. They had seen and spoken with the Christ risen triumphant over death.

The next Bible Stories are on page 368



The tandem a carol is a plant set on the know with a good air for if must be placed set in it  
(b) pl t why a he out for it down in these ph to get taken in er of forty mls a

## DOES A PLANT EAT?

In the answer to another question on page 2707 we have seen that certain leaves of plants can tell the difference between light and dark and this is a sort of seeing though it is very different from our sight and not nearly so useful. In the question we may remember first that trees are a kind of plant and second that *scdum* means any kind of sensation included in the sensation due to light so that really the answer is Yes.

And even if by  $\pi$  we mean only the sensation of  $\pi$ , the answer is

Yes, as regards many plants that we call sea creepers. Some of these are specially clever at feeling things because they actually eat insects and they require to know when an insect has been taken. *Plantago* (which I have probably found growing with the rest of Arran in Scotland) has plants in other places. The leaf of the plant is covered with tiny sticky sensitive threads. If you like to try it, have to touch the leaf with your finger, we see that it curls up. If a very small insect has been sitting on it, the leaf curls up on the leaf as if the leaf quickly reacts up and catches it. So the insect dies and the plant gets rid of it and it eats it.

This is the simplest kind of what are called *climbers* or *climbing plants* that are found in all parts of the world. Some of them in the large tropics that climb up and catch even strong insects. We know then that plants can see and can feel. But there is no proof that they can hear. Charles Darwin had the trellis played to a piano and many other people have made experiments of a similar kind but they all seem to show that plants do not hear.

FROM BAR CANY WIL STEP

[illegible]



question rightly to Nature. We understand now that our eyes can see to any distance from which light can reach them. Of course, the question whether the light has travelled billions and billions of miles, or only half an inch, makes not the slightest difference to our eyes.

It is quite a distinct question at what distance our eyes can distinguish the details of a particular thing. This depends on a great many things, but it can be reckoned to some extent, and it is very important to do this for the case of different telescopes. We know that if there were any building on the side of the moon next to us as large as St Paul's Cathedral, it could be made out in our best telescopes.

#### WHY CANNOT WE FLY IN THE AIR AS WE SWIM IN THE WATER?

This is a very just question, because the two problems of swimming and flying are exactly the same in principle. In both cases, the body is heavier than the thing around it, and the problem is, somehow or other, to prevent it from sinking. But in the case of swimming, the thing around the body, or *medium*, as we call it, is much nearer the heaviness of the body itself than in the case of air, and so the task is much less difficult. It is still less difficult in sea-water than in fresh, because sea-water is heavier. It is possible, however, for an animal that is not a bird, and that is made on very much the same principles as ourselves, to fly, and that animal is the bat. The bat knows, so to speak, as the Wright Brothers know, that if we want to fly, we must expose a large surface to the air, so as to get all we can out of the supporting power of the air.

So the bat, that has fingers of the same pattern as our own, has made them enormously long, and has stretched a web between them, and, thus provided with two beautiful aeroplanes it can fly. We really see the same thing, as regards swimming, in the case of many web-footed birds, web-footed frogs and newts, and other similar creatures.

#### HOW IS IT THAT A BIRD CAN FLY WHEN IT IS HEAVIER THAN AIR?

People who spend their lives in destroying the lives of other creatures know that, when a bird is shot, it falls, in other words, a dead bird obeys the force of gravitation exactly as a hailstone, or a raindrop, or a meteor must

do. The force of gravitation is always acting even on the living bird. It is therefore plain that some force is produced that acts against the force of gravitation, balances it when the bird maintains its level in the air, or more than balances it when the bird rises in the air. This force, as we have seen, is produced by the life of the bird. It can be produced in other things that are not alive, as in a flying-machine, whether a real one, or one of the toy butterflies that we play with. In any case, there is produced a force that acts in the opposite direction to the force of gravitation, and is, for the time being, superior to it. We know that, in the case of the bird, the force is produced by burning the sugar in its muscles, in the case of the aeroplane, it is produced by burning the petrol in the engine, in the case of the toy butterfly, it was produced by burning the sugar in our muscles when we wound it up. Foolish people sometimes speak as if these were cases of defying one of Nature's laws. They are nothing of the sort. Gravitation goes on acting on the bird, whether the bird rises or falls. But, when the bird rises, a greater force is being opposed to the force of gravitation.

#### IF THE EARTH IS SHRINKING, SHALL WE EVER BE TOPPLED OFF?

When the earth or anything else shrinks, the stuff, or matter, in it gets no less, it is merely packed more closely. What keeps us on the earth is its gravitation, and that depends upon the stuff in it. The stuff is there just the same, however much the earth shrinks, and the force of gravitation at the surface, and therefore upon us, will indeed be more powerful as the earth shrinks, simply because this must mean that we get nearer to the great mass of it.

There will be a limit in any case to the extent to which the earth shrinks, just as there is to the shrinking of other things. The more anything shrinks, the more resistance there is to its shrinking any more. When anything begins shrinking, we must imagine that there is plenty of room between its atoms, and, as it shrinks, they get nearer to each other, but soon there is less room between them, and the time will come when the force of the atoms, squeezing against each other, will resist the force

# PLANTS THAT CATCH AND EAT INSECTS



This is a Venus flytrap that grows in the bogs of the Carolinas. It has long, narrow leaves that are joined together at the base. It catches insects in water and drowns them.

It is a very interesting plant. It catches insects by the tentacles on its leaves. The insect is caught in a pit and is unable to escape. It is then digested and the plant grows again.

This is a pitcher plant. It has long, narrow leaves that form a deep pit. The insect is attracted to the nectar at the top of the pit and falls in. It is then digested and the plant grows again.



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that is making the thing shrink. When the two forces balance one another, it will shrink no more. We see this at once if we watch any crowd gather, it goes on shrinking until elbows begin to press against elbows, and then it stops.

**WHAT MAKES TREES TURN INTO COAL WHEN THEY SINK INTO THE GROUND?**

It is not every kind of tree that turns into coal, and we all know that coal is of many different kinds. It is not yet quite easy to make out all the reasons why different kinds of coal differ. We have to reckon with many facts, such as the particular kind of plant from which the coal was made, the amount of pressure it has been subjected to, the temperature it has been kept at, the kind of salts that were in the water that has trickled through it, and so on.

But still, this question can be fully answered in general terms. We may say that the difference between the tree and coal is, that the tree consists of a great many elements and compounds, while coal consists mainly of the element carbon only. Another way of putting our question, then, would be, What makes everything but the carbon go? The answer is, that the rest of the body of the tree is slowly oxidised, or burnt away, but the conditions which obtain in the ground are such, that while the rest is burnt away, the carbon is not, and so it remains and forms coal. We see, when we burn a candle, that carbon is more difficult than other things to burn away. We know what a lot of black smoke and soot is apt to come from a candle, or from a lamp. That is the carbon which we have not succeeded in burning away, but, certainly, we shall not find any unburnt hydrogen.

**WHAT IS PEAT AND HOW WAS IT MADE?**

Peat, we may say, is half-way between trees and coal. It is made, of course, from vegetable matter, and we may find it in layers many feet thick. About one-seventh of the whole surface of Ireland is occupied by bogs in which the formation of peat has occurred, or is occurring. It is said that an inch or two of peat forms every year. We do not suppose that peat is made from just the same kind of plant as most of the coal that we know so well was made from, but still, the process that goes on is really the same. Peat varies a good deal, according to the extent to which part of it

has been gradually oxidised away and the carbon left. On the average, about three-fifths of it consists of carbon. When dried, of course, it can be burnt.

**WHAT IS THE WILL-O'-THE-WISP?**

There is a particular kind of gas that is produced from decaying vegetable matter in marshy water, and is called marsh-gas. This is made of carbon and hydrogen, and is readily capable of being burnt. As it is produced, it is slowly burnt in the air, and so gives rise to a light. The gas, as it burns, shares in the general movements of the air, and so, of course, the light seems to dance about. This is a thing that has long been observed. It has an old Latin name that we may often see in print—*ignis fatuus*. It is also sometimes called Jack-o'-lantern. We can understand how stories might be made up about this light cheating travellers and dragging them into the marsh, where, perhaps, they would fall and die. At one time it was supposed that there might be some kind of tiny insects that hover over marshes at night, and give out a faint light. We know, of course, that there are insects that give out light, like the glow-worm. But it is now generally admitted that the slow burning of marsh-gas is the real cause of the will-o'-the-wisp.

**WHERE DOES INDIA-RUBBER COME FROM?**

India-rubber is simply the sap or juice of certain trees and plants. Centuries ago, when Columbus discovered the island of Hayti, he found the people using balls of solid sap that they had taken from the trees, but he did not see that it was a product of any importance. It was not until the end of the eighteenth century that we saw anything of it in England.

We first had it here under the name of elastic gum, and it was brought to us because it was found to be a good thing for rubbing out pencil-marks made on paper.

To-day, rubber manufacture is one of the most important trades in the world. Rubber is grown in various parts of Africa, in America, in Portugal, in British India, and in many other parts. Seeds of the best trees are taken every year to favourable climates, and, everywhere, the growth of the rubber-trees is extending. When

the tree reaches its prime the rubber gatherers cut rings in its bark. Soon the sap begins to flow from these openings and trickles down into pots placed at the foot of the tree. A good tree gives about twenty gallons of juice or forty pounds of rubber in a season. Then it will go on growing again heal the wounds in its bark and be ready to be tapped in the next following season. When the rubber leaves the tree it looks like thin cream. It hardens on meeting the air and when solid is sent to market.

#### HOW IS INDIA RUBBER PREPARED FOR USE?

In the factory india rubber undergoes what is called a vulcanising process. Sulphur is mixed with it and the mixture is made very hot. Then it becomes more elastic and very hard. That is what is needed for tyres of bicycles, motors and carriages, for hose pipes, springs, buffers, gas and water pipes, door mats, dolls, machine-belt, water-pumps, cushions, bed and so forth. Mixed with a larger quantity of sulphur and made still more hot the rubber becomes vulcanite or ebonite from which we make comb, pipe stems, speaking tubes, instruments that doctors use, the telephone and all sorts of other electrical appliances.

Rubber is needed for so many purposes that we can never get too much of it and clever men are working day after day trying to discover how to make it. They can make sugar and indigo and many other things that formerly they could get only from Nature and they can make rubber too. But the rubber that the clever chemist make costs so much that it is cheaper to buy that which grows in the forests across the sea. Some day men may be able to make it so cheaply that we shall not have to fear a rubber famine. Then tyres and rubber dolls will be cheap and perhaps we shall be able to have our streets paved with rubber so that they will end to much of the noise of the traffic. Could we not without the brain?

The world is entirely under the control of the brain and is so perfect at first. At birth the eye is open and in the first few weeks of the life we see a great deal. But for the first few months we are blind. At birth the brain is so perfect that it can do anything we can think of. After a few days it is so perfect that it can do anything we can think of. After a few days it is so perfect that it can do anything we can think of.

world. The brain is wonderful beyond all other things in earth or sea or sky but it must learn. The tiny little spot in the baby's brain that has twelve muscles to look after six for each eyeball can hardly be expected to manage such a team all at once. Yet in only a few weeks of practice even the tiny brain of a baby learns how to control all this wonderful living machinery. It can send just the right kind of command along its nerve to one muscle a different command along another nerve to another muscle still a different kind of command that it shall relax and let the others pull along yet another nerve to yet another muscle and so on in perfect harmony with all the twelve so that the two eyeballs may move up and down together or to left and to right or what is more wonderful and difficult still both to left and upwards together. We all of us do this thousand times every day of our lives and yet many people have never given it a thought. Why do we see only one thing when we look at it with both eyes?

The answer to this question can be guessed directly we make a very simple experiment on our eyes. Let us look at something with both eyes, say at the outlines of the window panes. Then let us press sideways with our finger on one eye so as to push it a little all the way inwards or outwards. We shall find that we see double. This can only mean that directly we interfere with the natural way in which the brain controls the movements of the two eyeballs we see double.

Each eyeball has six little muscles attached to it that pull it in the direction the brain desires. The nerves that run to the eyeballs cross but the eyeballs are all controlled by one little group of nerve-cells called the brain. The pictures at the back of the eyeballs have nerves, and by means of these nerves the brain can receive pictures of the two worlds as seen by the two eyes. The brain is so perfect that it can do anything we can think of. After a few days it is so perfect that it can do anything we can think of. After a few days it is so perfect that it can do anything we can think of.

shall understand how wonderful this is, for, when we look at something on our left or right, it must be that the outer part of one screen corresponds not to the outer but to the inner part of the screen in the other eye.

#### WHY DO SOME PEOPLE NOT SEE STRAIGHT?

When the two eyes are not moved perfectly together, we say that the person squints, and if such a person *took notice* of what both eyes told him he would see everything double, because he would never get the two images of anything he looked at thrown upon the corresponding parts of the screens at the back of his two eyes. But, as a rule, such a person gets into the way of taking no notice of what he sees with one of his eyes, and of really using only the other. So he does not see double.

The commonest reason why people squint is, that one eye is perhaps short-sighted, and the short-sighted eye gives such blurred views of things compared with the other that the brain, so to speak, makes up its mind that it is not worth while to use that eye at all. So it simply gives up taking the trouble of moving that eye along with the other one, and so the person squints. The way to prevent this from happening is to use spectacles, with glasses of different shapes for the two eyes, so that their vision is made equal. Then, of course, the brain finds it well worth while to move both eyes together.

#### HOW IS IT THAT GRAVITY DOES NOT PULL THE STARS TO THE EARTH?

Everywhere and always, gravity is pulling every atom of matter in the universe towards every other atom. If, therefore, there were no other force at work in the universe except gravity, all the matter in the universe—stars and sun and planets and moons, and everything else—would certainly and quickly be gathered together into one huge round ball. But what we are apt to forget is, that, while gravity is constantly working, other things are at work too, and what happens in this case, as in every other, is the result of the balance, the give-and-take, the interplay, as we say, between the forces that are at work.

One of the forces at work in the universe is the motion of the various moving things in it, and that motion is, of course, a force opposing gravity on all sides, except the gravity due to anything

towards which the body is directly moving. It is the earth's motion, for instance, that prevents the earth from rushing into the sun, and the earth's actual path is the result of the compromise between the motion that is in the earth, and the sun's pull. It has been supposed, by some thinkers, that most or all of the motions in the universe must get wasted away in time, not that anything is ever lost, but that they get frittered away as heat. If this were to happen some day, then gravitation, being unopposed, must necessarily pull everything together, and form the great ball we spoke of above. But there are so many other forces at work in the universe than those we have already clearly found out that we must not make any positive prophecies.

#### CAN THE WORLD GO ON IN ITS PRESENT FORM FOR EVER?

We are certain that, unless the sun should rush into another star, and make so much heat as to burn us all up—which is very unlikely—the earth will go on much as it is now for many ages to come, yet slow changes are always going on, and going on *in one direction*, that must lead to great results some day. The earth *must* be either getting cooler, or else using up the radium that keeps it warm, it is bound to become cold some day, as is the sun itself. That day may be far off—farther off than we are now from the time when the earth was formed—but it must come some time. Then there is evidence to show that the motion of the earth must be getting slower—though very slowly, and probably at last the earth will be drawn into the sun, and so end its independent history. Recent discoveries have made us form longer estimates of the time that these changes will take to happen, but it seems certain that they must happen some day.

#### WHY WON'T A PENDULUM SWING FOR EVER?

This question seems to assume that we might expect a pendulum to swing for ever unless something stopped it, and that is what makes it so good a question. If a thing moves, something has moved it. If the moving thing stops, something has stopped it. So our question is this. As a moving thing, such as a pendulum, must swing for ever unless something stops it, what stops it?

The things that stop a pendulum are first the resistance of the air. That we can understand if we think of a pendulum swinging in an ocean of water in stead of an ocean of air. If we make a vacuum as nearly as we can by sucking the air out of a space and then swing a pendulum in it it will swing for a long time. Only one thing remains to stop it and that is the rubbing or friction between the top of the pendulum and the string, it is hanging from. So now we know the two causes that stop a pendulum.

WHAT MAKES THE FIELDS WHITE WITH  
MIST AT NIGHT IN THE HOT WEATHER?

The must of course is water and it is not water vapour or gas but drops of liquid water. It is exactly the same

it did before and so a good deal of the water turns into liquid drops and makes a mist just like the mist our breath makes on a cold day. If there is much moisture in the ground this mist naturally forms nearest the ground and so looks like a sea of steam. It may be a very shallow sea round our legs so that we can see clearly above it far away but cannot see our own feet if we are walking through it.

WHY DOES A LUMP OF IRON TURN RED WHEN IT IS HOT?

When iron turns red the mean we know that it is producing light of the particular kind that impresses our eye as red and we catch the iron by this light. Of course we see the iron when it is cold



This photograph shows a flock of swans during the early of the day. The swans are in the water, and the background shows a line of trees and a building.

as a land and if we pass through a cloud it is a rain, it is like just the same as the kind of mist. But I fear the air is the new way of it can't be. If the air is made very thin the rain in the future and there is much water near and little or then the air as the day comes on a little bit a very large quantity of water vapour. This is a form of air mixed with the other two particles that make the air a little thicker, we can see it. If it is a little thicker a little more air. It is a little thicker a little more air.

[illegible]

beautifully clear for us. The same poet, Francis Thompson, has said the same thing, still more beautifully

I do think my tread,  
Surring the blossoms in the meadow-  
grass,  
Flickers the unwithering stars

Now, of course, a very serious question for us is whether this great law can be at all changed or altered in its working by anything. We have evidence, as we have seen, that distance does not destroy it at all. But if we come back to earth and study the working of gravitation in the laboratory, can we affect it there? Many workers for some years past, have devoted their whole lives to this question.

For instance, if we put something in between two other bodies, do we interfere with the gravitation between them—as if gravitation were something like light, which could be cut off—or does gravitation take no notice of obstacles? The answer to this, as the result of the most careful study, is that the gravitation between two bodies is exactly the same, their consequent weight and motion, or tendency to motion, being absolutely unaltered by the presence or absence of any obstacle of any kind between them.

#### THE GREAT FORCE OF GRAVITATION THAT NOTHING WE KNOW CAN STOP

Whether through air, or through water, or through the ether of space alone, whether through intervening blocks of granite or anything else, the power of gravitation is neither more nor less. If no distance and no obstacles interfere with gravitation, what would be the result of heat? If we take a thing that has a certain weight owing to the earth's pull for it, and its pull for the earth, and if we examine that same thing, first when it has been made fifty times colder than ice by being plunged in liquid air, and then when it has been made white hot, we find that the influence on the force of gravitation is nothing.

At least, we may put it this way. If we lift this book up in our hands from the table—say, six inches—we increase its distance from the centre of the earth. The book is lighter because the force of gravitation regularly lessens as the distance increases, though no distance will prevent it from

working. Now, this difference in the weight of the book, due to its having been lifted six inches, is, of course, extremely slight. But in the newest experiments that have been made on gravitation, we are able to say that if, for instance, heat produced a difference in gravitation as great as the tiny difference produced by lifting the book from the table, we should have detected it. Most people will agree that if tremendous changes in temperature do not affect gravitation even to this extent probably they do not affect it at all.

#### ATOMS OF MATTER THAT WEIGH THE SAME WHETHER THEY ARE BOUND OR FREE

We have failed to abolish gravitation by distance, we have failed to block it by any obstacle, we cannot affect it by temperature, but what will happen if we take certain weights of two elements, like oxygen and hydrogen, and then combine them to make water? In other words, does chemical combination, or, of course, the opposite, which we call decomposition, affect gravitation? Do all the atoms of two different things weigh exactly the same, no matter whether they are independent of each other, or whether they are powerfully bound to each other, as they are in the case of water? The answer to this question is that chemical combination and decomposition have no more effect on gravitation than anything else has.

Other ways of trying to affect gravitation have been experimented with. They have all signally failed. We know of nothing that will cause this force to turn one hair's breadth either way from its appointed course. As Sir Joseph Thompson, one of the greatest of living authorities, has lately said, there seems to be no way of getting hold of gravitation. If we could once get our hands on it, we could do anything, but no method that has ever been tried has enabled us to modify it at all. Most people do not in the least understand what this means, however.

#### A WELL-KNOWN MAN WHO TRIED TO DEFEY THE LAW OF GRAVITATION

In a celebrated discussion last century, a very well-known man declared that he could defy the law of gravitation by holding an apple in his hand and preventing it from falling; but he was opposing force with force, and as long as the law of gravitation acted, he had

to pay his price every moment for holding up the apple. Exactly the same applies to flying machines. The force of gravitation is always acting and from moment to moment the flier like the bird has to balance this force by some other acting in the opposite direction. The bird gets this force by burning the sugar in its muscles; the aeroplane gets it by burning the petrol in its engines.

#### STRANGE THINGS THAT WOULD HAPPEN IF WE COULD CONTROL GRAVITATION

But suppose for a moment that in some way we could abolish gravitation or get hold of it or cut it off by a screen then everything would be utterly different. There would be no problem in flying. Neither the bird nor the aeroplane would require to burn any fuel except just the little amount required to overcome the resistance of the air. There would be nothing to pull the bird or the aeroplane downward and an apple released from the hand would not fall until we gave it a smart tap downwards. But one might go on for pages describing the endless extraordinary results that would follow if we could control gravitation. That time may come.

At present however not only can we not control it but we cannot begin to understand it. We can measure it to a nicety but as to how it acts we know nothing. There are at least twenty-four theories on the subject and as Sir Joseph Thompson has said any one of them may be true. But just because we cannot influence gravitation in any way we can test none of the theories. There are hints however that by working at the problems of electricity we shall ere long be able to go farther than this in this study.

#### A BOY WHO HELD THE WORLD BY WATCHING AT A SWING MACHINE

At present however about 250 years after the discovery of gravitation we can only say that while we have perceived the truth of Newton's law and its importance (everybody knows that) we can imagine we know nothing of the cause of gravitation. It can be said as I have known many at school.

It was right to begin with Newton's laws of motion and then to mention his laws of gravitation. But when they led us to Newton's great law of gravitation, but we were not to go to the bottom to the real beginning of our

these inquiries. This was the story of Galileo whom we all think of as an astronomer. He was indeed one of the greatest of astronomers. But most of his astronomical discoveries depended upon that ingenious mind which enabled him to invent the telescope and the qualities of mind enabled him also to invent many experiments so important as to make it true that the science of motion began to exist with Galileo.

There is a splendid bronze lamp which hangs to day as it did in Galileo's time from the roof of the cathedral at Pisa and if we watch it we notice that it swings. Watching it at the age of nineteen Galileo put a finger of one hand on the pulse of the other wrist and using this natural clock he found that always whether the lamp was making large swings or small each swing or vibration took exactly the same time as any other. This was a most important discovery in the science of motion and fifty years later Galileo put it to practical use in making a clock that depended on the constant swing of a pendulum.

#### WHY THE PENDULUM SWINGS TO AND FRO AND THE LAW THAT GOVERNS IT

It is worth our while to notice one or two things about the swing of a pendulum. First there is Galileo's great discovery about the constancy of the rate for any particular pendulum. Second we must ask ourselves where the motion comes from. When the pendulum hangs still the bob of the pendulum is a near the centre of the earth so it can get gravitation and is therefore satisfied and does not move. But if we put the pendulum in motion either by pulling it up by lifting it to a side and letting it go then it starts to swing.

What? If we let a weight the end of a piece of string and let the string in our hand we can state that it comes to rest. We see at once that when the bob of the pendulum is at one end of its swing it is not in equilibrium. But it will fall. In fact it will fall to the centre of the earth. But we shall see that it will not fall to the centre of the earth until it has swung back to the other side. It does not fall to the centre of the earth because it has momentum. It has momentum because it has been set in motion by the force of the hand that pulled it to the side. It has momentum because it has been set in motion by the force of the hand that pulled it to the side.



more slowly, because it is doing work against the earth's pull, and therefore losing power. So at last it stops, and then the same thing happens again.

The power in the pendulum is the power that was put into it when it was pushed or hit. It is not there when the pendulum is at rest, and it has not come from nowhere. The least touch is sufficient to start it swinging, and we may ask ourselves what becomes of that little portion of power that was put into it when it was touched. Now, nothing is lost, and if the pendulum stops swinging no matter how little the swing ever was, we must account for the power that started it. It goes just as the power goes in a cricket-ball or a curling stone, it goes in friction where the pendulum is hung, and it goes in the resistance of the air. If, then, we could make a pendulum so hung that there was no friction, and if we could swing that pendulum in empty space, instead of in a heavy ocean, which the air really is, it would swing for ever. The power put into it would have no occasion to leak away, and so would remain.

#### THE WONDERFUL MACHINERY OF YOUR BODY, WHICH NEVER STOPS IN HEALTH

Let us not suppose, however, that this is what is meant by perpetual motion. Directly we asked that pendulum to do any work by turning a wheel or resisting a little air, or anything else, then the power in it would leak away, and it would come to a stop.

Perpetual motion is a phrase which is always used for a certain idea, but few phrases could be worse to express what it means. A healthy child is a case of perpetual motion, and, indeed, whether we are old or young, asleep or awake, parts of our bodies are always moving. So far is perpetual motion from being impossible, that, indeed, the more we learn, the more we find that everything is moving—perhaps even that which we call matter is simply a kind of motion of something. It is almost a question whether there is anything in the world to study except motion, and yet we must have heard it said that perpetual motion is impossible. We should understand what we really mean when we use this phrase. What is impossible is to get something out of nothing, and that is what

so-called perpetual motion machines all try to do. For hundreds of years past people have been trying to make machines that would do work for ever without being wound up or without having anything burnt inside them.

#### A MACHINE THAT NO MAN WILL EVER BE ABLE TO MAKE

More than a hundred years ago now, the Paris Academy of Sciences decided that it would take no farther notice in future of any accounts of perpetual motion machines sent to it. At first sight that seems very wrong, because science must always be willing to listen to new things. But it is really quite right, because we know now that no one will ever make a perpetual motion machine. The man who did that would be a Creator.

If power is to be used, it must come from somewhere, if work is done, some one or something must do it. This is true even of the atoms of radium, as it is of everything else. More than that, it is strictly, rigidly true of our own bodies, and of the bodies of all living things. They are a million times more marvellous than any machine that was ever made. Parts of them will work continuously for, perhaps, as long as a hundred years; these machines can repair themselves without stopping, but they are not perpetual motion machines in the sense that this phrase means.

For every heart-beat, for every time that we raise an arm or an eyelid, a certain amount of work has been done, a certain quantity of matter has been moved through a certain distance at a certain speed, and if we know what these figures are, it can be calculated exactly how much carbon, probably in sugar, had to be burnt up in the body in order to do that work.

#### WHY WE MUST BE FED WITH POWER IF WE ARE TO SPEND POWER

If we were perpetual motion machines we could live without food. And the whole point and meaning of the fact that we and all living creatures have to take food, is that we are not perpetual motion machines, but, like every other machine on earth, must be fed with power if we are to spend power. It was long supposed that living creatures were exceptions to this great law, which, as we see, is really the law.

of the conservation of energy. We now know that this is not so and that all living creatures however wonderful they may be and however different from things around them are yet parts of the universal whole and subject to the same laws. In every generation there are people who will not believe this and who propose either by the use of a living creature or by some kind of machine to make something out of nothing but they have always failed and always must fail.

Now we may go back to another great discovery of Galileo about which we read on page 270 and we shall see how its meaning fits in with what we have learnt about work. By dropping balls of



The nearer a thing is to the centre of the earth, the heavier it is. If it were possible to erect a long pole to the top of the globe and put one-pound weight on each end, each end would draw the pole toward the centre of the earth. The nearer a thing is to the centre of the earth, the heavier it is.

different weights from the leaning tower at Pisa Galileo showed that they all reach the ground at the same time. It had been believed for about two thousand years on the authority of a great Greek thinker Aristotle that a ball weighing ten pounds would reach the ground when a ball weighing five pounds would

only have reached half way. In all that time so curious is the way in which people used to take things for granted no one until Galileo had really asked Nature what the truth was.

But we must understand this. Surely a big ball rolling upon the earth is doing a big job by the earth. I say, however, that a little ball is doing a big job. Surely new men have been struck by a small ball more than by a big one? Surely where the more work is done the ball is greater? The answer is that there is more power at work, but there is more work to do, for there is more matter to move. The ball does the work faster the power is greater. The work of the stone is the same as the work of the ball, but the stone is doing more work in the same time.

and so all bodies falling under the influence of gravitation fall at the same speed, and for any body whatever or every second that it falls its speed is increased in the same degree as in any other case.

Now we shall say that after all this is simply not true because everyone knows a feather takes longer to fall than a stone. But if we could imagine the air swept away the feather would fall like the stone. This can be proved. We can take a long tube remove the air from it—or at any rate remove quite enough for our purpose—and then let go say a bullet and a feather at the same moment from the top of the tube. We find that they reach the bottom

together. That was what Aristotle was wrong in. There is no matter that Aristotle made. Aristotle thought that there were two things weight and lightness. Weight made things fall and lightness made things rise. Aristotle thought that the principle of gravity in them like a feather would fall and that that had

the principle of buoyancy. If the air would rise according to Aristotle Galileo says that they would rise. Everything in the universe is gravity in it just because the law of gravitation applies to all matter everywhere. If there is no air in a thing, a penny will fall as fast as a feather. How can we tell? If you cork a bottle and let it fall, the cork will come out first. If you cork a bottle and let it fall, the cork will come out first. If you cork a bottle and let it fall, the cork will come out first.

But we have seen that the work of the stone is the same as the work of the ball, but the stone is doing more work in the same time. The work of the stone is the same as the work of the ball, but the stone is doing more work in the same time. The work of the stone is the same as the work of the ball, but the stone is doing more work in the same time.

is motion, there is force, power, or energy at work. This idea of force as invoked in all motion was new to Galileo, and it is the foundation of the whole science of motion. The proper name for the science of motion is dynamics, which is the Greek for force.

## ENERGY THAT IS NEVER CREATED AND CAN NEVER BE DESTROYED

The truth is that no one before Galileo seems to have seen that causes must have effects, and effects causes; that big causes must have big effects, and big effects big causes. So, wherever there is much motion, there is a proportionate cause at work. Galileo, of course, wrote in Latin, and used the Latin word *vis*, which means force, and Newton also wrote in Latin, and used the same word, but last century an Englishman, Dr. Thomas Young, began to use the word energy. And we say now that wherever there is motion, there is energy, that this energy is never created and never destroyed, but eternally transformed. These great ideas really date from the mind of Galileo, who actually worked out for himself in a rough way all of Newton's laws of motion. It is very interesting, however, that though both Galileo and Newton must have had in their minds the idea of the conservation of energy, neither of them stated it in so many words, and this was left for some German men of genius in the nineteenth century.

Energy is energy wherever it is, and in whatever form it is, but it has different forms, and two of these must be understood. The words describing them are certainly rather long, but they are not difficult to understand. When a thing is moving, we say that it has in it energy of motion. The proper name for this, taking the Greek word that means motion, is *kinetic* energy.

## THE TWO KINDS OF ENERGY THAT ARE SEEN IN THE SWINGING PENDULUM

There is no difficulty about this. When the bob of the pendulum swings downwards, faster from moment to moment, it is gathering kinetic energy, or energy of motion. Now, the other kind of energy is energy that does not show itself at the moment in anything, but the power or potency of it is there — *potential* is Latin for power. It is therefore called

potential energy. Now, throughout the world we can constantly see potential energy turning into kinetic energy, and *vice versa*. The pendulum is a most beautiful illustration of this. When we pushed or raised the bob of the pendulum, its motion upwards showed kinetic energy, when it ceased moving upwards any farther, that motion was not lost, but was stored up in the bob of the pendulum as potential energy. It did not move, but it had within itself the power to move.

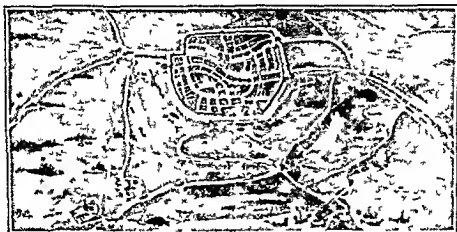
Then, when we let it go, the potential energy was changed into kinetic energy, as its motion proved. Thus kinetic energy enabled the pendulum to rise again after it had reached its lowest point. And now, at every moment, as the pendulum rises, it moves more slowly: its energy of motion, or kinetic energy, is being changed, though not lost, and when the pendulum reaches its highest point on the other side, all the kinetic energy has been changed into potential energy, and so this transformation backwards and forwards goes on as the pendulum swings.

## HOW MEN ARE LEARNING TO GET ENERGY FROM THE SUNSHINE

But we can learn from this still more about the changes of energy. When we pushed or lifted the bob of the pendulum, where did that kinetic energy come from? We have already learnt that the living body did not create it, our muscles made this energy of motion out of the potential energy existing in the sugar stored up in the muscles and derived from the food. This kind of potential energy, existing in sugar and other chemical things that can be burnt, is sometimes called chemical energy; but it is a kind of potential energy, and can be changed into energy of motion just as in the case of the bob of the pendulum when it is at its highest point.

But where did that potential energy in the sugar come from? Did the plant which made that sugar create that energy? That cannot be, we know. The plant made that potential energy out of the energy of motion, or kinetic energy, of the sunlight which streamed upon it. And we are now learning that that kinetic energy of sunlight probably came in greatest part from the potential energy stored up in the atoms of the sun.

The next part of this is on page 369



## HOW THE SEA SAVED HOLLAND

SET in the midst of picturesque gardens and orchards with the Rhine running through the streets in many channels, Leyden of which we see a plan on this page was, in May 1574, indeed a beautiful city. But the whole country was disturbed by the Spaniards who were trying to force their religion on the Protestant Netherlands. The people of Leyden would not submit, so an army under Valdez was sent to besiege the town. Encouraged in their resistance by the Prince of Orange, the brave little garrison shut the gates of the city, and the inhabitants were put on a strict allowance of food.

Now Holland is built with levels of the sea, which is only kept back by a series of great dikes. The prince sought means to relieve the need, but with the Spaniards all round the town and above the water there seemed but one way. He could not send ships to Leyden by sea, it being all so full of the sea to Leyden and let the garrison have away the Spaniards. He would force them open the sluice and save Holland. The people were in line and said, "Better not to be a land than a lost land."

And so in August of the year 1574 the garrison opened the sluice and the water came in over the dikes and

toward the starving city. The Spanish army watched the water rise higher and higher between the dikes, first with surprise then with alarm. A Dutch fleet of six vessels was fitted out and sent to attack the city which was however well protected so that it could not be taken for several weeks.

First a strong tyke, the Lardich, lying five miles from the city, was captured and pierced. The boats sailed through the opening, but the next dike was found still one foot above the water, and when that was reached the water beyond was too shallow to carry the boats, and they could only advance through a canal which was well guarded by the Spaniards. After a long delay the Spaniards retreated, and the water flowed in over the dikes and into the city.

On September 8, 1574, a great army from the north was sent to force three days of severe fighting. The water was now so high that the Spaniards retreated, and the water came in over the dikes and into the city. At the same time a great storm of wind and rain fell on the city, and the water came in over the dikes and into the city. The water was now so high that the Spaniards retreated, and the water came in over the dikes and into the city.

not yielding, but his courage and patriotism did not fail and he answered. "I know that we shall starve to death if we are not soon relieved, but starvation is preferable to the dishonoured death which is the only alternative. My life is at your disposal, but expect no surrender so long as I remain alive."

The people gained courage from his words, a dove flew into the city bearing a message of hope, and, on October 1, a gale blew the waters close up to the walls. On the flood floated the relieving fleet, and there was a sharp encounter with the Spaniards, whose boats were sunk. Now the fleet was within a few hundred yards, and the

men, jumping out, shouldered the boats through the shallows. There remained but one more fort of the besiegers to be taken. At dead of night the citizens watched lights come out from it and flit across the water.

In the morning a boy was seen at the top frantically waving his cap. He was a Dutch boy, and had seen the Spaniards escape. So the fort was entered, and the fleet swept alongside the quays throwing bread to the starving people. Then men, women, and children went to the cathedral, and thanked God for their deliverance, and, as a monument of their gratitude, they next year founded the famous Leyden University.

## THE CLIMB UP THE CAPITOL HILL

WE read, on page 606, how the beautiful city of Rome was taken and plundered by the Gauls. A story of one of the bravest Roman citizens who lived at that time stands out in the history of that terrible disaster. When Rome was besieged, one of her ablest generals was away from the city, for he had been falsely accused of taking more than his share of the plunder at the capture of Veii, a neighbouring city. Angry and disgusted with the treatment he had received, Camillus had taken up his abode at Ardea. By his ability, he saved this city from destruction by the invading Gauls. When the Romans heard of this exploit they repented, saying, "If only our brave Camillus were here, he might save our city also from the dreadful Brennus." So they sent a message, begging Camillus to return and help them. But Camillus, who was a proud, haughty man, refused, saying that he was only an exile, and would need a decree from the Senate before he returned to Rome.

Now, the senators who were still alive were in the besieged Capitol, which stands high up on the Capitoline Hill, and could not be reached without passing through the Gallic lines, but a patriotic young Roman, Pontius Cominius, offered to undertake the mission.

Dressed as a peasant, and with corks about his neck to keep his head above water, he plunged, one dark night, into the Tiber, and drifted down to the base of the Capitoline Hill. Now came

the dangerous part of the venture, for Cominius had to climb up to the Capitol. He clung to grass, vine-stem, or point of rock as he dragged his body up the steep ascent, using his bare feet to aid him, and all the time keeping a sharp look-out for any Gaul on the watch, until at last he reached the rampart. There he called out his name, and was immediately surrounded by his eager countrymen. He told them that Camillus only waited the Senate's decree to come to their help. Camillus was quickly voted Dictator by the few senators who were left, and Cominius at once returned down the hill, luckily escaping without being seen by the Gallic sentinels.

Though he got safely away, the Gauls noticed that someone had disturbed the creepers, and that stones were displaced, so they planned a night attack on the Capitol. When they carried this out they found the sentinel asleep, but the cackling of the sacred geese in the Capitol warned the citizens, and they repulsed the attack. However, the besieged were starving, and were driven to treat with Brennus. While the ransom was being discussed, Camillus, with his soldiers, appeared on the scene, and exclaimed, "It is with iron, not gold, that Romans guard their country."

Soon after, the Gauls were driven away, and the Romans acknowledged that they owed their rescue to the brave Cominius, who, at the risk of his own life, had brought Camillus to them.

The next Golden Deeds are on page 3659

# The Childs Book of POETRY

## A FABLE TOLD IN VERSE

AMONG the many lesser poets who were attempting only the treatment of homely subjects have yet left us poems which, though in form no better than the commonest rhyme have said something that will be long remembered. Mary Howitt has a place of some eminence. We have already had occasion to speak of Mrs. Howitt and her husband, William Howitt in reading other poems of theirs printed in this book. They deserve to be remembered for the healthy and elevating character of all they wrote. None of Mary Howitt's verses for young people is better known than *The Spider and the Fly* with which almost every English boy and girl is bound to make acquaintance. Like many another of the poems given in our book, this is a fable in rhyme. The story itself is a very old one the idea of the spider luring the silly fly to destruction having been a popular illustration of the danger of listening to flattery long before Mrs. Howitt gave it this versified form.

## THE SPIDER AND THE FLY

Will you walk into  
my parlour? said  
the spider to the fly  
"Tis the prettiest little  
parlour that ever you'll see  
The way into my parlour is up a  
winding stair  
And I've many curious things to show  
when you are there  
Oh no no said the little fly to  
a kind invitation  
For when you see your spinning stair can  
I ever come down again

I'm sure you will be weary of it with  
scurrying up so high  
Will you sit upon my little bed? said the  
spider to the fly  
There are pretty curtains drawn around  
the sheets are fine and thin  
And if you like to rest a while I'll sing  
to tickle you  
Oh no no said the little fly I've  
done all that I can  
They never ever wake again who creep  
upon your bed

Said the cunning spider to the fly Dear  
friend what can I do  
To prove it warm at noon I'll always  
sit for you  
I have within my pantry gold we eat all  
that we like  
I'll give you very warm water to  
drink when you like  
Oh no no said the fly I'll never  
be deceived  
I've thought of you long and  
I'll not be so

So the spider said to the fly I'll wait  
with a little while  
How long said the fly I'll wait for you  
I'll wait for you  
I'll wait for you  
I'll wait for you  
I'll wait for you  
I'll wait for you  
I'll wait for you

I thank you said the  
fly and it went  
away  
And it did not  
come again  
The spider sat  
and waited  
For the fly to come  
But it never came  
So the spider sat  
and waited  
And it did not  
come again  
The fly  
went into the  
ground  
And it did not  
come again  
The spider  
sat and waited  
And it did not  
come again

Then he came out to  
see if the fly  
could be seen  
But he did not  
see it  
The spider  
sat and waited  
And it did not  
come again  
The fly  
went into the  
ground  
And it did not  
come again

Alas how very soon  
the spider died  
Heard his wife  
saying to her  
Why did you  
Wife I have  
said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you

Alas how very soon  
the spider died  
Heard his wife  
saying to her  
Why did you  
Wife I have  
said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you  
I have said to you

## FIDELITY

Among the numberless poems in which the fidelity of the dog is celebrated, this, by William Wordsworth, takes a high place. There are many instances of dogs that have shown great fidelity to their masters as the shepherd's dog here described, and they are all worthy of the poet's praise.

A BARKING sound the shepherd hears,  
A cry as of a dog or fox,  
He halts, and searches with his eye  
Among the scattered rocks  
And now at distance can discern  
A stirring in a brake of fern,  
And instantly a dog is seen,  
Glancing through that covert green  
The dog is not of mountain breed,  
Its motions, too, are wild and sly,  
With something, as the shepherd thinks,  
Unusual in its cry  
Nor is there anyone in sight  
All round, in hollow or on height,  
Nor shout nor whistle strikes his ear:  
What is the creature doing here?

It was a cove, a huge recess,  
That keeps, till June, December's snow;  
A lofty precipice in front,  
A silent tarn below,  
Far in the bosom of Helvellyn,  
Remote from public road or dwelling,  
Pathway, or cultivated land,  
From trace of human foot or hand  
There, sometimes, doth a leaping fish  
Send through the tarn a lonely cheer;  
The crags repeat the raven's croak,  
In symphony austere,  
Thither the rainbow comes, the cloud—  
And mists that spread the flying shroud,  
And sunbeams, and the sounding blast,  
That if it could would hurry past,  
But that enormous barrier holds it fast

Not free from boding thoughts, awhile  
The shepherd stood, then makes his way  
O'er rocks and stones, following the dog  
As quickly as he may,  
Nor far had gone before he found  
A human skeleton on the ground  
The appalled discoverer with a sigh  
Looks round to learn the history

From those abrupt and perilous rocks  
The man had fallen, that place of fear!  
At length upon the shepherd's mind  
It breaks, and all is clear  
He instantly recalled the name,  
And who he was, and whence he came;  
Remembered, too, the very day  
On which the traveller passed that way.

But hear a wonder for whose sake  
Thus lamentable tale I tell:  
A lasting monument of words  
This wonder merits well  
The dog, which still was hovering nigh,  
Repeating the same timid cry,  
His dog had been through three months' space  
A dweller in that savage place

Yes, proof was plain that since the day  
When this ill-fated traveller died,  
The dog had watch'd about the spot,  
Or by his master's side,  
How nourished there, through that long time,  
He knows who gave that love sublime,  
And gave that strength of feeling great,  
Above all human estimate

## SHE IS FAR FROM THE LAND

Thomas Moore, the celebrated Irish poet, is likely to be remembered in time to come chiefly for his exquisite songs, of which "The Minstrel Boy," on page 642, is one of the best examples. The following is another of his rarest lyrics. "The Island of Sorrow" referred to in the last line is, of course, the poet's native land of Ireland.

SHE is far from the land where her young hero sleeps,  
And lovers are round her, sighing,  
But coldly she turns from their gaze, and weeps,

For her heart in his grave is lying  
She sings the wild song of her dear native plains,  
Every note which he loved awaking;

Ah, little they think who delight in her strains  
How the heart of the minstrel is breaking

He had lived for his love, for his country he died,  
They were all that to life had entwined him,

Nor soon shall the tears of his country be dried,  
Nor long will his love stay behind him

Oh, make her a grave where the sunbeams rest,  
When they promise a glorious morrow;

They'll shine o'er her sleep like a smile from the West,  
From her own loved island of sorrow

## THE OLD FAMILIAR FACES

Charles Lamb is one of the most attractive characters in the whole history of English literature. His fame rests chiefly on his charming essays, as he gained no great distinction in poetry. Together with his sister Mary, he wrote a number of poems for children, several of which appear in our pages, though the following lines in blank verse cannot be described as juvenile poetry. The sentiment which they convey, however, is so human and so universal—the pathos of looking in vain for "the old familiar faces" when one has lived through the long years, lingering after one's friends have all departed—that they really appeal to "children of all ages."

I HAVE had playmates, I have had companions,  
In my days of childhood, in my joyful schooldays—

All, all are gone, the old familiar faces

I have been laughing, I have been carousing,  
Drinking late, sitting late, with my bosom cronies—

All, all are gone, the old familiar faces

I loved a love once, fairest among women,  
Closed are her doors on me, I must not see her—

All, all are gone, the old familiar faces

I have a friend, a kinder friend has no man  
Like an ingrate, I left my friend abruptly,  
Left him, to muse on the old familiar faces

Ghost-like, I paced round the haunts of my childhood

Earth seem'd a desert I was bound to traverse  
Seeking to find the old familiar faces

Friend of my bosom, thou more than a brother,  
Why wert not thou born in my father's dwelling?

So might we talk of the old familiar faces

How some they have died, and some they have left me,

And some are taken from me; all are departed,

All, all are gone, the old familiar faces

## THE USE OF SIGHT

**THE USE OF SIGHT**

A thought the power of seeing is one of the great advantages  
it is possible to have. It is a great help in healing the eyes. It is  
the will and you to be best if the better than some who re-  
flect. We must use our eyes for some purpose. The we  
re not a log this great power. Some God has given us.  
That is the effect of the following poem by Andrew  
D. Macfie. It is a poem of the first kind. It is a poem  
and novel which was popular in the day. Mine  
I heard was the third of famous actors and of what  
who had his eyes. And the larger world of his life

"WHAT Charles returned, papa exclaimed  
How hort your walk has been!  
But Thomas—Julia—where are they?  
Come tell me what you've seen.

So tedious, till I dull a walk  
Said Charles I'll go no more.  
I just stopping here then lying there  
Over this and that to pore

I er we t the fields near Woodlan I ll we  
An d ju t went up the hi l  
Th n by the river a le came down  
A ar the f air lay a mill.

Now Tom and I Julia both ran in  
Oh fear papa said they  
Thy sweet & walk we both have had I  
Oh what a pleasant day I

Near Woodlan I'll wait we cross the fields  
And by the mill we came  
Indeed!" exclaimed papa how th?  
Your brother did the same

"That very full he found the walk.  
What have we there? Let's see!  
Com. Charles enjoys this charming treat.  
As we love as mine."

First look I spy at this small bran h  
Which on a tall oak grew  
And by its slimy berries white  
The rilletor we knew

A bird a green ran up a tree  
 A wren, her we call  
 Wh. with his front 11 wounds the bark  
 To fission insects small

As I may say in a crowd I will  
And I am at the top of the  
I will be at the top of the  
I will be at the top of the

Young say rye martins swallow all  
South levels fish to pay  
At the water wheel it a fol  
And the flow away

71 1 1 1 1 1 1 1 1 1 1 1 1  
I xch 1 1 1 1 1 1 1 1 1 1 1 1  
In 1 1 1 1 1 1 1 1 1 1 1 1  
In 1 1 1 1 1 1 1 1 1 1 1 1

"We are a belief that we will be  
It is a belief that we will be  
We are a belief that we will be  
It is a belief that we will be

1. የገቢት ስራ ስለሚደረግበት ሰዓት ማሳደግ  
 2. የገቢት ስራ ስለሚደረግበት ቦታ ማሳደግ  
 3. የገቢት ስራ ስለሚደረግበት ሰዓትና ቦታ ማሳደግ

1. The first group of people  
 2. The second group of people  
 3. The third group of people  
 4. The fourth group of people  
 5. The fifth group of people

True taste with knowledge and paper  
By observation a gain is  
You've both well used the gift of sense  
And thus reward obtained

My Julia in this desk will find  
A drawing box quite new  
This spy-glass, Tom you oft des red  
I think it now your due

And pretty toys and pretty gifts  
For Charles too shall be bought  
When he can see the works of God  
And praise them as he ought

## DISPUTE BETWEEN NOSE AND EYES

[illegible]

**BETWEEN**  $\Delta$  and  $\nabla$  is a strange couple

The spectacles set them unhelpfully wrong.  
The point and interest was still the same old known  
To which the eyes of spectacles ought to  
belong.

So Tongue was the lawyer and argued the case.

With a great deal of skill and a well filed learning

What chief Henry Farwell balanced law  
 & justice for his talent in nicely discerning it

"In behalf of the New York State Bar Association  
And your Honor, the State Bar Association will go

That th. Some has had spectacles always 17

Which amounts to no ~~same~~—time out of

Then holding the spectra for up to the exist-

Your love, hip observers if y are not  
with a staid

Designed to close that 1 1/2 inch gap

Q. Again would your be say a great deal  
opposed

That the nature of your employment is such as to require you

They will wear it at all spectacles, right?

"On the whole it appears that the above is a fair estimate of the total number of persons who have been employed in the various occupations mentioned above."

With a remaining 100,000 in 1967 & 1968

That the foregoing is a true and correct

And the State will not pay for the  
 drug

He passed out the night of 11/11/51. By the next morning he was dead.

[illegible][illegible]

Don't ask for it until you're ready to pay for it.

*[Faint handwritten notes at the bottom of the page]*



## THE CASTLE-BUILDER

Famous among the writers of France is Jean de Lafontaine, born 1621, died 1695. Although an idle and good for nothing sort of fellow, he was a writer of great and original gifts. He is best remembered for his fables in verse, which have often been translated into English, and a typical example of which is here given. Every boy and girl is, no doubt, familiar with the "moral" of this fable, which is just the old saying "Never count your chickens before they're hatched." The same idea is used in "The Milkmaid," page 3346.

It happened on a summer's day,  
A country lass as fresh as May,  
Deeked in a wholesome russet gown,  
Was going to the market town,  
So blithe her looks, so simply clean,  
You'd take her for a May-day queen,  
Though for her garland, says the tale,  
Her head sustained a loaded pail  
As on her way she passed along,  
She hummed the fragments of a song,  
She did not hum for want of thought—  
Quite pleased with what to sale she brought,  
She reckoned by her own account,  
When all was sold, the whole amount.  
Thus she—"In time this little ware  
May turn to great account with care  
My milk being sold for—so and so,  
I'll buy some eggs as markets go,  
And set them, at the time I fix,  
These eggs will bring as many chicks,  
I'll spare no pains to feed them well,  
They'll bring a vast profit when they sell  
With this, I'll buy a little pig,  
And when 'tis grown up fat and big,  
I'll sell it, whether boar or sow,  
And with the money buy a cow  
This cow will surely have a calf,  
And there the profit's half in half,  
Besides, there's butter, milk, and cheese,  
To keep the market when I please  
All which I'll sell, and buy a farm,  
Then of sweethearts have a swarm  
Oh, then for ribands, gloves, and rings I  
Ay, more than twenty pretty things—  
One brings me this, another that  
And I shall have—I know not what I  
Fired with the thought, the sanguine lass,  
Of what was thus to come to pass  
Her heart beat strong, she gave a bound,  
And down came milk-pail on the ground.  
I eggs, fowl, pig, hog (ah, well-a-day!)  
Cow, calf, and farm—all swam away!

## LONG AGO

Lucy E. Field is surely one of the most popular of all the poets whose work appears in our book. He never touches any subject without infusing it with a new charm and a freshness which is all his own. The following is from his poem

I once knew all the birds that came  
And nestled in our orchard trees,  
For every flower I had a name,  
My friends were woodchucks, toads, and  
I knew where thrived in yonder glen  
What plants would soothe a stone bruised  
Or  
Oh I was very learned then,  
But that is a very long time ago  
I found a spot upon the hill  
Where cherubim were said to be found;  
I found the rainbow near the mill  
Where in the olden time we had a pound  
I found the world in the very tree  
Where the little birds were free  
And all the world in the very tree  
But that is a very long time ago

And pining for the joys of youth,  
I tread the old familiar spot;  
Only to learn this solemn truth  
I have forgotten, am forgot  
Yet here's this youngster at my knee  
Knows all the things I used to know,  
To think I once was wise as he—  
But that was very long ago  
I know it's folly to complain  
Of whatso'er the fates decree,  
Yet, were not wishes all in vain,  
I tell you what my wish should be  
I'd wish to be a boy again,  
Back with the friends I used to know  
For I was, oh, so happy then—  
But that was very long ago!

## WHAT BOBBIE WOULD LIKE

By permission of Mr. Frederic E. Weatherly we are able to read here these pretty verses from the pen of that famous song-writer, who, although he has written so much for the grown-ups, takes pleasure every now and then in turning his pen to write of childhood and children's thoughts.

I'd like to be a farmer,  
With lots of stacks and mows,  
And fowls and pigs, and carts and gigs,  
And four-and-twenty cows  
I'd drive them all to market,  
On summer mornings fine,  
"Oh, come and buy," I'd stand and cry,  
"Buy, buy, good masters mine!"  
But if they would not buy them,  
It would not give me pain,  
I'd simply say, "Fair sirs, good-day!"  
And drive them home again.  
I wish I were a farmer,  
With lots of lambs and sheep,  
I'd run and play with them all day,  
Until we went to sleep  
I'd take the wool to market  
On summer mornings fine—  
"Oh, come and buy," I'd stand and cry,  
"Buy, buy, good masters mine!"  
But if they would not buy my wool,  
It would not cause me pain,  
I'd come and say, "Dear sirs, good-day,  
Here is your wool again"

And if they could not put it on,  
I'd put it on myself,  
And all the rest, when I was drest,  
I'd lay upon the shelf  
For when the winter days come round,  
And all the world is cold,  
I know full well my wool will sell  
For all its weight in gold  
And so I'll be a farmer,  
Right happy in my lot,  
And he who cares may buy my wares,  
And other folk need not!

## THE CAGED BIRD

These lines are by William Lisle Bowler, a contemporary of great distinction in his day, whose poems were imitated by such great writers as Coleridge and Wordsworth. His works are now little read, and are familiar only to literary students. He was born in 1752 and died in 1817.

Oh, who would keep a little bird confined  
When cowslip bells are nodding in the wind,  
When every hedge is as with "good-morrow"  
And heard from wood to wood, the blackbird  
Oh, who would keep a little bird confined  
In his cold wire prison?—Let him fly,  
And he'll be singing "How sweet is liberty!"

# LITTLE VERSES FOR VERY LITTLE PEOPLE

The writing of nursery rhyme is by no means so easy as one might imagine. It is that is why so few good rhymes which are really worth calling nursery rhymes are written nowadays. When people think things are easy to do they are apt to neglect them and so it is with a slipshod way. But Miss Laurence Alma-Tadema, who is a daughter of Sir Lawrence Alma-Tadema the celebrated painter, is a wisely thoughtful wife to write nursery rhymes, and as a result we have had many charming little verses of this kind from her pen. As a criticism, these are given on this page, and the next. Like all that she has written, they have real merit in them, and, indeed, many of her poems for little folk have been set to music with great success.

## MARCH MEADOWS

### A LARK

**L**ARK BIRD, lark bird soaring high  
Are you never weary?  
When you reach the empty sky  
Are the clouds not dreary?  
Don't you sometimes long to be  
A silent goldfish in the sea?  
Goldfish, goldfish diving deep  
Are you never sad, say?  
When you feel the cold waves creep  
Are you really glad, say?  
Don't you sometimes long to sing  
And be a lark bird on the wing?

### LAMBS

O little lambs! the month is cold  
The sky is very gray  
You shiver in the misty grass  
And feel all the wind that passes  
Wait, when I am big—some day—  
I'll build a roof to every fold  
But now that I am small I'll pray  
At my mother's knee for you  
Perhaps the angel with their wings  
Will come and warm you little things,  
I'm sure that if God knew  
He'd let the lambs be born in May.

### A TWILIGHT SONG

**B**ABY, now is time for bed  
O let him have his rest, for we  
Hid your little bed for him  
In the twilight west now  
We've your child and in the night  
You'll all sleep as fast as you can  
I've got this good to tell  
In her bed to creep and crawl  
So is little Jack like you  
To go to sleep now  
When she's asleep and I am  
She'll be a little like I ever.

### THE NESTING HOUR

**R**OSEBUD, how late you are  
But you're not late at all  
For you're just in time  
To see the birds at their nest  
We'll be with you in a moment  
And see the little ones.

## PLAYGROUNDS

**I**n summer I am very glad  
We children are so small  
For we can see a thousand things  
That men can't see at all  
They don't know much about the nose  
And all the stones they pass  
They never lie and play among  
The flowers in the grass  
They walk about a long way off  
And when we're at the sea  
Let father stoop a bent back in  
He can't find things like me  
But when the snow is on the ground  
And all the puddles freeze  
I wish that I were very tall  
High up above the trees.

### THE NEW PELISSE

**B**ABY, got a new pelisse  
Very soft and very neat—  
Like a lammy in her fleece  
Shes all white from head to feet  
Thirty lambs could pay a curl  
Mother, sew them stitch by stitch  
All to cloth a baby girl  
Do you think shes very rich?

### THE LITTLE SISTER

#### BATH TIME

**B**ABY, got a new bath  
Nest so soft and cozy and bright  
It's to keep you warm and dry  
But the water's so cold and wet.

#### LET HIM

**B**ABY, I've a  
Close your little eyes  
When it's dark to go to bed  
The water's not so hot now.

#### LET HIM

**B**ABY, I've a  
I've a new  
If you want to be a little  
I've a new  
The water's not so hot now  
But the water's not so hot now.

# IF NO ONE EVER MARRIES ME



If no one ever marries me—  
And I don't see why they should;  
For nurse says I'm not pretty,  
And I'm seldom very good—

If no one ever marries me,  
I shan't mind very much;  
I shall buy a squirrel in a cage,  
And a little rabbit hutch

I shall have a cottage near a wood,  
And a pony of my own,  
And a little lamb quite neat and clean  
That I can take to town.

And when I'm getting really old,  
At twenty-eight or nine,  
I shall buy a little orphan girl  
And bring her up as mine

## KING BABY ON HIS THRONE

**K**ING BABY on his throne  
Sits reigning O, sits reigning O!  
King Baby on his throne  
Sits reigning all alone

His throne is mother's knee,  
So tender O, so tender O!  
His throne is mother's knee,  
Where none may sit but he.

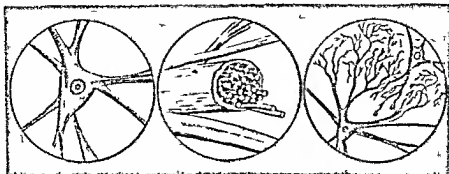
His crown it is of gold,  
So curly O, so curly O!  
His crown it is of gold,  
In shining tendrils rolled

His kingdom is my heart,  
So loyal O, so loyal O!  
His kingdom is my heart,  
His own in every part.

Divine are all his laws,  
So simple O so simple O!  
Divine are all his laws,  
With love for end and cause.

King Baby on his throne  
Sits reigning O, sits reigning O!  
King Baby on his throne  
Sits reigning all alone





In the left-hand picture showing a nerve-fibre guided, we see the nucleus and nerve-fibres. These fibres may intertwine with those of another cell as seen in the right-hand picture, but they never split. The middle picture shows a bundle of nerve-fibres in their sheath, with smaller bundles branching off.

## A FOREST OF NERVES WITHIN US

If we feel gently at the back of the elbow rather towards the inner side we find a thing that feels like a sort of cord and if we squeeze it or knock it accidentally we discover that it is what we call the funny bone. It is a nerve and therefore belongs to the most marvellous of all marvellous things. If we take a nerve and look at it we find that it is just a cord made up of tiny threads which are called fibres. It is these fibres that are the real nerves. The big cord is simply a bundle of them travelling part of their journey in each other's company.

A nerve fibre is a thing which is probably not to be found anywhere in the vegetable world, but these things begin to appear quite low in the scale of the animal world, and their importance and number become greater and greater as we ascend. There is no part of the body that has not nerves supplied to it, and there is no part of the body that does not receive in some way or another all the nerves running to the body and for out.

When we cut the nerve fibre we find that it is a very long thread. We can pull it by a thread or cut it with a pair of scissors. It is a kind of fat. There are great many parts of the body which are



can think of a nerve as if it were an electrical wire and the sheath may be regarded as what is called an insulator—a thing to prevent the current that flows in the nerve from leaking outside. It is very interesting to take a modern electrical cable such as men lay in the Atlantic Ocean and to cut it across and see what it looks like and then to take a good sized nerve and cut it across and magnify it so as to compare it with the cut cable. We are at once that men have for a long time made their cables on exactly the same principle as nerves are made, with bundles of fibres like and little all carefully insulated from each other. Of course the nerve is a million times more a natural but the general principle of the way in which the nerves are packed together and the way in which each is insulated so as to prevent any leakage of its electric current are the same.

When we cut a nerve fibre we find that it is a very long thread. We can pull it by a thread or cut it with a pair of scissors. It is a kind of fat. There are great many parts of the body which are

a nerve, muscles will twitch. We have excited fibres which carry orders along the nerve from the brain to those muscles. This shows that nerves carry something, and may do so in either direction, from the brain, or to the brain. The nerve-fibre is therefore a conductor. It is just like the wires in the cable. They do not make messages, but they carry them. What runs along the wire will run in either direction. It is probable that any particular nerve-fibre carries what it carries only in one direction.

#### THE LIVING NERVE THAT CARRIES MESSAGES THROUGH OUR BODIES

The wire carries an electrical current. As long as the wire is not broken, and is properly insulated, the current will run. The wire is not alive, and, though we by no means understand what happens in it, yet it has not about it the mystery which we find when we look at a nerve.

For the noteworthy thing about a nerve is that it will only carry what it carries *when it is alive*. We can remove a piece of nerve from an animal that has been killed, and can study it in various ways. If we keep it moist with water containing a little salt, and if we keep it warm enough, it will live for quite a long time, and as long as it is alive things that disturb one end of it will send something through it. But when it dies it will no more carry messages than a piece of string will. What makes the difference between life and death in the nerve we cannot understand until some day, perhaps, we shall learn what life is. We can see no change under the microscope to account for this difference, for we have to kill the nerve in order to look at it under the microscope.

#### THE MYSTERY OF THE NERVE-CURRENT THAT NO MAN CAN UNDERSTAND

The thing that runs along the nerve we call a nerve-current, or a nervous current. Current simply means something that runs, and that is really almost all we know about it. It is not the same as anything else in the world; it directly depends upon the life of the nerve, as we have seen. It is not electricity. Curious changes are produced in a nerve when a nerve-current runs along it, and among these changes is the production of electrical currents of various kinds, which have been long

and carefully studied. These show that an electrical change has been produced in the nerve when a nerve-current runs along it, and the study of these electrical changes may help us to understand the nerve, but it is a very great and serious mistake to suppose that the nerve-current is electrical.

Electrical currents in a cable or anywhere else move at a wholly different speed from that of a nerve-current. Nerve-currents have been measured again and again, and they travel at rates which, compared with the movement of electricity, are very slow. The rate of a nerve-current seems to be about the same as the rate at which a cricket-ball can be thrown. An electrical current is hundreds of thousands of times faster.

Nothing seems to be used up in a nerve when it conveys a current, any more than in the case of a telegraph wire. So we cannot make a nerve tired. As long as it remains alive, it will go on sending currents as often as we choose to start them in it. The case of a nerve-cell is very different.

#### THE NERVE-CELLS UPON WHICH ALL OUR FEELINGS DEPEND

We have only been talking about conductors, remember. We have, so to speak, taken a piece of one of these conductors, just as if one took a piece out of a cable, and we have studied that. But if we wished really to understand telegraphy, we should have to study what is at the ends of the cable, and that applies to the case of the nerve too. We found that we could excite a nerve by hitting it against something, as when we hit our funny-bone, or by pinching it, and there are dozens of other ways, as, for instance, by giving one end of it an electrical shock, dropping chemicals on it, and so on. But, of course, that is not what happens naturally in our bodies. We must find where the nerve comes from.

Every nerve-fibre grows out of a nerve-cell. It is part of that cell. It is only the servant of the cell, carrying orders from it or messages to it. The real thing, where the greatest mystery lies, and upon which everything depends, is the nerve-cell. When we study the development of the body, we find that every nerve grows out of the cell that it belongs to; we find also that, if

nerve cells and nerves the number of nerve cells is very few and the arrangement is very simple. They are usually arranged in pairs, ready to carry feeling in the most of the animal in its most but as ascend the scale nerve cell and in get more numerous and often form a semicircular number of them just as the together into little balls each of which is a sort of nervous center somewhat like a trip on a telephone. When these collections of nerve cells become very large they make a thing that we can only call a brain and such are the brains of a bee and a wasp for instance. The whole arrangement of nerve cells and nerve fibers is called a nervous system. When the first ladder was run into existence there was a central nerve in a number of places and the nerve fibers and the central part of this new nervous system was made by the locomotor. The ladder has been run up as the nerves have been put in the common part of the ladder between it and the new wasps. Now the nervous system was made by the ladder and the nervous system was made by the ladder.

[illegible]

system. The brain, or the spinal cord, or both, can send to it messages upon which its life depends, and it, on the other hand, can send messages to them.

When we come to study the central nervous system, we find it so arranged by means of this double connection that every tiniest part of the body is really in true communication, when necessary, with every other part of the body without exception. It is this amazing fact that helps to explain how the body becomes a whole in spite of the infinite variety and number of its parts. In no city on earth, however rich in telephones, and speaking-tubes, and telegraphs, and post-offices, and messenger-boys, is there any arrangement a thousandth part as wonderful as the arrangement by which the nervous system connects all the parts of the city of Mansoul, as John Bunyan called it.

#### THE FOREST OF NERVES RUNNING TO AND FROM EVERY PART OF OUR BODY

We have already learnt what is necessary regarding nerves. If we simply understand that the lining of the heart, the wall of a vein, the base of a nail, every muscle-fibre, and all other parts of the body are doubly connected by nerves with the central nervous system, we do not need to inquire how and where these nerves run, though, of course, the doctor has to spend long months and years in studying this. We must devote ourselves now to the central nervous system, and especially the brain.

We saw when we were studying alcohol that the central nervous system consists, in a way, of a number of levels, or layers, and that, as the bodies of animals have become more and more wonderful, new layers have been, so to speak, piled up on the older ones, and each new layer is, so to speak, the master of all the layers below it. It is in this way that we can come to understand the working of the brain and the spinal cord. The spinal cord is very old, so to say, its business nowadays is to attend to things which are beneath the notice of the brain, as, for instance, the movements of the stomach and that kind of thing. It is a sort of highly trusted and responsible butler in the house of man, and, like other butlers it not only looks after a great many small matters on its own account, so as

not to trouble the master, but it is also the master's means of communication. As a rule, the master gives orders to the butler, and then the butler does the rest.

#### THE SPINAL CORD THAT ACTS AS BUTLER TO THE BRAIN

On the other hand, tradespeople and so forth, when they have anything to say, do not go to the master, but interview the butler, and he takes the message to the master, so also does the spinal cord. When I close my hand, my brain, which gave the order, did not speak directly to the muscles of my hand. No nerve-fibres run directly from my brain to those muscles, but nerve-fibres do run from my brain to the spinal cord, which is my butler. They give orders to certain nerve-cells in the spinal cord, and from those nerve-cells there *do* run fibres which go to the muscles of my hand. In the same way, when I feel a draught on my skin, the nerves from my skin do not run direct to my brain, they run to cells in the spinal cord, from which communication is made to my brain.

If we cut across the spinal cord, and take a very thin slice of it and stain it with various dyes that will show up the way in which it is made, we find that its structure exactly corresponds with its duties. We find in it fibres and cells. Some of these fibres are running to the brain, some from the brain; a great many of them arise from cells in the spinal cord, and run to other parts of the spinal cord, and end there. If for a moment, we think of the spinal cord as a huge exchange, or place of business, then these fibres are like the private wires that do not come from, or go to, the outer world, but connect one part of the place of business with another.

#### THE WONDERFUL BOX IN WHICH THE CENTRAL NERVOUS SYSTEM IS KEPT

The usefulness of the spinal cord very largely depends upon the proper working of these beautiful arrangements which keep every part of it informed as to what every other part of it is doing, and enable different parts of it to act in harmony when they so require—which is practically always.

The picture on page 3565 shows us the central nervous system as it appears when taken out of the wonderful box—the skull and backbone—which exists to protect it. We see how, at its upper end,





to it, we must be using the cerebellum. The hippopotamus has practically no idea of catching at all. It takes a very long time to see even things that it likes, and if they get into a corner, it is so clumsy that it has not sense enough to use either its feet or its mouth to get them out again.

#### THE LITTLE BRAIN OF THE GREAT HIPPOPOTAMUS

All this depends upon the smallness of its brain, and especially of its cerebellum. It is reckoned that the brain of the hippopotamus weighs about the same as that of the horse, the weight of whose body is only one-fifth as great. It has been proved over and over again that, in the history of life, success has always gone more and more to brains, to skill as against strength, to mind as against muscle. The hippopotamus is a remarkable instance of an animal that has survived through long ages from the days when brains in general were much smaller than they are now, and the explanation is not to be found in its huge size and strength, but entirely in its mode of life. Its size and strength could never have saved it against better brains.

In the past there have been far bigger and stronger animals than even the hippopotamus, and they have all died out, but the hippopotamus is content to live upon grass and similar plants growing in rivers. It has its nostrils right on the very top of its face, so to speak, and so it can lie with its whole body in the water, and just leave its nostrils above to breathe by. In this way it saves itself by hiding, and still lives on, while the other stronger and cleverer animals have completely disappeared from the earth.

As we pass upwards in the scale of life, we find that with the growth of the cerebellum, and the development of skill, there comes a time when even the mouth, that dogs and cats and lions and sea-lions are so clever in using, is not a good enough instrument for the clever brain.

#### THE USE OF THE ARMS WHICH GIVES MAN HIS GREAT POWER

Something even better is required, and so, in the main line of ascent, we find that the animals called lemurs, which are a very humble and ancient kind of monkey, use their hands a little for grasping as well as walking, though they prefer to use their mouths, as anyone

can see who feeds them at the Zoo. But when we reach the highest apes, we see that they find and examine and lift their food with their hands, and then carry it to their mouths. The arms, then, limbs which for countless millions of years have been used by all sorts of different animals for the same purposes as the hind legs, and for no other, now come to have special purposes of their own, and every finger becomes precious.

Cleverer even than the half-erect apes is man, who, after crawling babyhood is past, frees his fore limbs for ever from the duty of locomotion and learns how to use every one of his fingers separately, as with the typewriter or the piano. There has therefore been an immense development of skill in man—though mere strength has decidedly fallen off—and with it there has necessarily gone a great development of the cerebellum.

This is very interesting, because it helps us not only to understand the brain, but also to understand children. Children belong to a race that lives in the world by its cleverness of all kinds, and so they like to practise their skill. This is why children love games of skill, and this especially is why, ever since children existed, they were fond of balls.

#### WHY IT IS RIGHT THAT BOYS AND GIRLS SHOULD PLAY

Of course, grown-up people do not like to have their windows broken; but still it is right and natural for children to play. What we call play, and stupidly think of as waste of time, is now known by wise people to be part of the necessary education of a child, if it is to reach the best possible for it in health of mind and body. Its play is really an essential part of the work of the child.

It is a great pity that, though any mother cat may be seen teaching her kittens to play, for she knows how important it is for them to become skilful, many children in England have nowhere to play but the street, no one to teach them good games, no one to care what becomes of them. And yet, if we are not to care about our children, and therefore the future of mankind, many of us would perhaps not care if the whole earth shot up in flame and vanished this very moment. But we hope that before long all children will be able to have happy playtimes.

The next part of this is on page 3713



money to pay for it. The longing for books was increasing, but the power to produce them more rapidly did not keep pace with the demand. Thus the need for some grand new invention to give people books was very urgent when John Gutenberg, the inventor of proper printing, was born, at Mainz, Germany, about 1410.

**GUTENBERG, THE ALMOST UNKNOWN MAN WHOM ALL MEN HONOUR**

It is a curious thing that printing, which records the history, so far as it is known, of every other invention, should tell us so little of its own story. We do not know with whom the idea of printing first began. We know that Gutenberg was the first man in history to give the world a book printed with separate pieces of movable type, but the credit of the invention is claimed for other men who lived at the same time as himself. We do not even know exactly the year of Gutenberg's birth. The date generally accepted is the year 1410, but it is also stated to have occurred eleven years earlier. We know nothing about his boyhood. His work caused the greatest revolution in the history of knowledge that the world has ever witnessed, yet we are as ignorant of the story of his private life as if he had been an ordinary citizen.

The reason for the confusion as to the actual invention of printing may be a little more easy to understand if we take a glance at the attempts at book-making which were being made when Gutenberg was a youth. The idea that there was a better way of producing books than writing them by hand had already entered men's minds. Men had found out the way to print from what we call woodcuts. These were drawings cut into blocks of wood, which, on being inked over, printed a picture on the paper pressed upon them.

**HOW MEN LEARNED TO PRINT PICTURES BEFORE THEY COULD PRINT WORDS**

That was picture-printing, and it made men familiar with the thought of tracing figures upon paper by means of carved wood, from which many copies could be printed.

But that was a long way from printing a book from types which, when one book had been printed, could be used again and again to print other books. The woodcuts gave only pictures, they did

not print words. It would have taken too long to carve a page of words on a block of wood, and it would have been impossible to print books for which every page of matter needed a separate block of wood. What they wanted was a number of movable letters that could be put together to form words, and then when the page was printed the letters, or types, could be distributed, and set up again to form other pages. It fell to Gutenberg to invent this wonderful scheme—or that, at any rate, is the decision of the best historians.

The rival-historians tell a different tale. They say that a man named Lourens Janszoon Coster, of Haarlem, Holland, was the inventor of the movable types, and that he actually printed a book from them, and that then his servant stole the types and ran away with them to Gutenberg, whose service he entered and whom he taught to print. In studying the history of printing we are bound to take all the evidence, and, having done so, we are able to say that there is nothing to support this story.

**HOW GUTENBERG'S PARENTS WERE DRIVEN FROM MAINZ BY A MOB**

The story about Coster was never printed until a hundred years after the death of Gutenberg. We may be sure that the world would have heard of it in Gutenberg's time had there been any truth in it. Germany and Holland had their law courts then, and Coster would have gone to law against Gutenberg or the faithless servant had there been any truth in the story. When people did have a case against Gutenberg, they did not hesitate to go to court against him, as we shall see.

Let us now take the life-story of Gutenberg as far as we know it. His parents were of noble birth. His father's name was Gansfleisch, but he took the name of his mother, so that that name might be carried on, she being the last descendant of her house. She little thought what honour and glory he would bring upon her name. When John was about ten years of age his parents had to flee from Mainz. There was a great quarrel between the poor and rich of the city, and his parents, who were among the rich, had to fly and take their boy with them. They went to Strasburg, and there the inventor of printing grew up.

He was a lad of bright and inventive mind. When little more than fifteen he was engaged in experiments for polishing stones and making mirrors. He required more money than he was able to secure at home; therefore he induced a citizen named Andrew Ditzeln to become security for him so that he could borrow the money.

## A BUSINESS IN LOOKING GLASSES THAT FAILED AND WHAT CAME AFTERWARDS

Dritzel must have thought highly of the youth for he entered into partnership with him the business being the polishing of stones and the making of mirrors. Of course looking glasses had been made before this but young John had found out a way of making better ones than had been known before. They must have managed very well for they seem to have remained in this business for the next twelve or thirteen years. A lucky accident perhaps took them out of it. There was to be a jubilee at Sixty Chapel and the partners had counted on selling a great many mirrors. The jubilee was postponed and the stock remained unsold.

This seems to have put an end to the business. Gutenberg now turned to the work of his life. He took into partnership two other men named Albrecht Heilmann and Anton Heilmann, his former partner Dürer also being in the business. They began as printers but apparently their idea was to use wood cuts—the idea of the movable types had not yet come. The partners must have thought well of the business for when in 1448 Dürer died his brothers went to him to try to make Gutenberg take one of the brothers into partnership in the deal making plant. Gutenberg won the day. His brother had to take the brother into partnership but was not to reveal the secrets of his business.

### GUTENBERERG RETURNS HOME AFTER HIS LONG EXILE

After the end of a period of mystery, Custer long remained to say for himself what he knew of events. "I think we all know it. All that may see is to have gone in, work it there, and find where it is, and then go to the place where it is, and then go to the place where it is. That is all that is known. I can't say it's all there. It may be that it is all there, but I can't say it's all there."

great art to the world his native  
Munz ought to be its cradle. He  
returned to Munz in 1449 after having  
been an exile for twenty six years.  
He made his home in a house which  
formed part of the possession of his  
family. That he had now completed his  
scheme for the new printing we know  
from the fact that he was able to borrow  
money from a shrewd merchant at Munz  
named John Faust. The latter provided  
two sums of money to enable him to make  
his types and to purchase other materials.  
As security Faust had all the printing  
stock which Gutenberg was to make

They took into their service a kalfin worker in metal named Schockly and he was all greatly to assist Cutenberg in carrying out his ideas in the making of the type. Cutenberg seem to have set out to make each letter separately. If he wanted 100 copies of the letter A he would set to work to carve 100 copies of the letter in wood.

**GUTENBERG'S BIBLE, THE FIRST PRINTED BOOK IN ALL THE WORLD**

But this was too new. Besides, the wooden letters were too soft to hit. The improvement that Schooler suggested was important. He carved the letter on the end of a piece of metal. With this metal letter he punched a mould in a softer metal. Then all that remained to be done was to melt metal and pour it into the mould, and copies of the letter could be made as fast as metal would harden.

The fact that Schoeffel did this for Guenther was very good and that was not to say any credit from Guenther. The first part they was quite happy the career out of the details was very much to Schoeffel's advantage.

[illegible]

At last, in 1455, the first printed book, the complete Bible in the Latin tongue, bound in two great volumes, was presented to the world. The triumph of printing was at once established. Men agreed that it was "as clear as handwriting," and that seeing that many copies had been printed at the same time, the cost was far lighter than that of copying by men, while the work was done far more quickly.

#### THE DISASTER THAT OVERTOOK GUTENBERG IN THE HOUR OF HIS TRIUMPH

But Gutenberg's sun set as soon as it rose. No sooner had the great Bible been printed than a quarrel arose. Gutenberg and his partner had done a great and splendid thing in giving to the world a noble Bible as the first-fruits of the printing press. It is something of which printers have ever since been proud, that the first book ever printed was the greatest and holiest book in the world.

But when that work was ended, strife at once broke out. The greedy Fust claimed back the money he had lent. He knew that Gutenberg could not pay him, and that, perhaps, was why he immediately pressed his claim. As he could not have the money he seized all the printing plant. He was legally entitled to do this, but many things are legal which are monstrously cruel. Poor Gutenberg, in the very hour of his triumph, was kicked out of his office, and his beloved press was left to Fust and Schoeffer, while he was poorer than when the idea of printing first entered his brain.

However, he was not to die without another effort to further his invention. He found a good friend in Dr. Conrad Humery, who enabled him to set up another press, from which he printed one or two books.

#### THE SAD ENDING OF A LIFE THAT HELPED TO CHANGE THE WORLD

But nothing prospered with Gutenberg after that, and he ended his days as a pensioner, living on the bounty of the Archbishop of Mainz. Nobody noted his death. He passed away in 1468, thirteen years after the completion of the work which made him one of the world's greatest men. Nearly four centuries afterwards the citizens of Mainz erected a statue in his honour. He needed it not then. His fame had gone forth into all lands. Within sixteen years of the printing of the first Bible the art of printing was

being practised in the principal cities of Germany and Italy. Presses sprang up in Strasburg, Cologne, Rome, Florence, Naples, Bologna, and Milan. We in this country were too busy with the Wars of the Roses to notice the miracles that were being performed. But for us, too, came the hour and the man.

It was in 1477 that we saw the first book printed in England. It was a great time for England, for it marked the dawn of our real learning. Remember that until fifty years before this time the English language was never taught in this country! French was taught for writing and reading by the upper classes, but not English. There was no written English. All documents and letters were written in the French which the Normans had brought over with them. But now we were to have books for Englishmen, printed in their own mother tongue. The man to work this wonderful change was William Caxton, whose name is honoured in our land as much as that of Gutenberg and the other men of his age who all helped forward the great art.

#### WILLIAM CAXTON, THE MAN WHO BROUGHT PRINTING TO ENGLAND

Caxton was born in Kent about 1422 so that he was twelve years younger than Gutenberg. In these days we should think it strange if parents did not educate their children. It was different in Caxton's days, and when he was an old man he used to say that he always felt bound to pay for the soul of his father and mother, because they had sent him to school. They little thought when they put their boy to school what a great thing they were doing for the education of the whole English-speaking race. After he had quitted school they apprenticed him to a wealthy mercer, who afterwards became Lord Mayor of London, and thought so well of Caxton that at his death he left the youth a sum of money.

After he had served his apprenticeship Caxton went to Bruges. He was then twenty-four years old, and was able to set up in business for himself. At that time several English merchants were engaged in business in Bruges, and Caxton, being an energetic and clever man, prospered. We have evidence of his prosperity in the fact that four years after his arrival he became security



for another merchant for the sum of £110, which would be a large amount in our money. So far as we know, Caxton came to England on only two occasions during the next thirty years. He made himself master of several languages, and became a sort of English ambassador at Bruges, the British government entrusting him with missions of importance.

#### HOW THE SACKING OF A CITY SCATTERED PRINTERS THROUGHOUT EUROPE

As we have seen, the knowledge of printing soon spread about Europe. It was largely helped in an unexpected direction. The city of Mainz, where it had begun, was sacked in 1462. The office of Fust and Schoeffer was wrecked, and their workmen were scattered. They spread into various countries, and took with them their knowledge of printing. Thus the misfortune of Fust proved a blessing in disguise to other people. Books multiplied, and printed copies came into the hands of Caxton.

When he was nearly fifty years of age he set to work to translate into English a book on the history of Troy. No doubt he had enjoyed reading it, and wished that people who knew only English should share his enjoyment. When he had translated it he caused it to be printed, and it appeared in Cologne, so far as is known, in 1474, six years after the inventor of printing had been laid in his grave. We do not know whether Caxton actually set up the type and printed the book himself, or whether he paid someone else to do the work. We do know that he had been much in the company, in Cologne, of a man named Colard Mansion, a famous writer, who had become a printer.

#### THE BOOK THAT CAXTON PRINTED IN A WESTMINSTER ABBEY OFFICE

Whether the book was printed at Bruges or Cologne can never be decided, and it really does not matter. The point of importance for us is that, delighted with the new art of printing that he had mastered, Caxton left for England in 1476 to set up as a printer.

He took an office in premises belonging to Westminster Abbey. It is commonly supposed that he printed actually in the abbey. That, however, is not the case, for his office was in or near one of the almshouses which a

king had founded. The book translated and printed abroad by Caxton was the first which had ever appeared in the English tongue. The first book ever printed in England was either his book on the game of chess, or one devoted to the sayings of the philosophers. He now had a busy time as a printer. He printed short stories and pamphlets, he printed the works of Chaucer, religious works, and many others. Nearly a hundred of his books still exist; not all perfect, of course. Parts of some were found to have been used in binding later books; others had been nibbled by rats and carried to their holes in Westminster Abbey. Some of his books sell to-day for over £2,000 each.

One of the men who helped Caxton with his printing was Wynkyn de Worde, who came over with him from Belgium, and, at Caxton's death, in 1491, succeeded to his printing plant. He carried out the work which his master had begun. He improved the type, and printed over 400 books.

#### THE MEN WHO FOLLOWED CAXTON AND SPREAD PRINTING IN ENGLAND

But before the death of Caxton printing had made a great advance in England. Two years after Caxton's return to England a printing press was set up at Oxford by Thomas Rood. Two years after, one was started at St Albans, by a man called the schoolmaster. A man named Lettoun started for himself in London in the same year. Cambridge waited for over forty years before setting up her first printing press.

In the meantime, the art had spread far and near over the country, and Scotland had her first press in 1507, when two men named Walter Chepman, who found the money, and Andrew Myllar, a bookseller, who had been to France and learned the way to print, obtained a licence from the Scottish king, James IV, to set up in business as printers. The firm was not carried on after the death of these two men, and then for some years the Scottish Parliament, while having its Acts of Parliament printed, actually had to send to France to get the work done.

The art had now become firmly established in Europe. It spread to the American continent by the help of a Spaniard in Mexico, who, in 1536, published the first printed book ever





seen in the West The first English book was published in 1638, by Harvard College, which had been founded by an Englishman named Harvard, who had settled in America

Of course, printing was not at first very good The first improvements in type were made by Wynkyn de Worde But the greatest were made by Richard Pynson He like Wynkyn de Worde, was a foreigner, whom Caxton had brought over to London Pynson became printer to the King of England, and performed a most important service by printing the first book in Roman type, that is, type like that which appears on this page

One of the most famous of early Continental printers was Aldo Manuzio, of Venice, who was born in that beautiful city about 1446. With him began the practice of printing, in addition to the ordinary copies of a book, some few copies on specially good paper and in fine bindings Manuzio was the first to make the type called *italic*, type like that in which the word itself is here printed It is believed that he took as his model for this type the beautiful handwriting of the great poet Petrarch

#### HOW THE GOVERNMENT TRIED TO KEEP KNOWLEDGE FROM THE PEOPLE

As printed works increased in this country, education became better and more common, so that many people were able to read and discuss the events printed in the books and pamphlets. This alarmed the government, and in 1530 what is known as a press censorship was established If a man printed anything not approved by the censor he was cruelly punished. This state of things lasted for more than 150 years, and the lot of the printer was so hard that printing became almost a lost art again Men would not risk imprisonment and fines to publish works which the people wanted, but which the tyrannical-censor might condemn Even before the appointment of a censor, Bibles had been seized and burnt by the Church Not until 1694 was the office of censor swept away

When the censor ceased to be, men picked up hope again, and printing soon began to improve. Better type was made, but still the printing machinery continued pretty much as it had been

from the first The type had to be laid flat upon the press, and the paper printed by being pressed by hand labour upon the inked surface of the type Not until 1814 was the printing of a newspaper by steam first tried

#### THE MAN WHO MADE THE FIRST STEAM PRINTING MACHINE

The inventor of the first steam printing machine was Frederick König, born at Eisleben, Germany, in 1774 He struck out in a new direction Instead of printing from a flat page of type, he made a matrix—the principle of which is explained on page 881, and from that made a cylinder, which could be placed on a machine and made to turn off printed papers as fast as the machine could work A man named Nicholson had an idea for a cylinder printing machine at about the same time, but König's was the successful one

The great success of König's invention was due, however, to John Walter, proprietor of the "Times" The "Times" is the greatest newspaper in the world, and it was fitting that it should lead the way in so splendid an advance. Mr Walter had many difficulties to face before the machine was perfected, but at last, on November 29, 1814, the paper came out, printed by steam power.

If we could see to-day the first steam press on which the "Times" was printed, we should be amused to think what a wonderful invention it then seemed But it is always easy to improve, once a great idea has been grasped That first steam press was the parent of all that have followed, and must always be held in honour

#### HOW THE "TIMES" LED THE WAY IN THE CHANGES THAT HAVE COME ABOUT

The "Times" steam press was the biggest advance in printing made since the day of Gutenberg himself. Since then new inventions for printing have followed each other with great rapidity Printing coloured pictures has become one of the most wonderful of the printer's triumphs. For the setting of type, machines have been made which seem to do all but think; while the great machines that print the papers and books of the present day are among the most marvellous contrivances ever invented by the genius of man



sea How I long for Christmas to come!"

"Rejoice in our love!" said the Air and the Sunshine "Rejoice in thy youth and thy freedom!"

But rejoice he never would. He grew and grew, in winter as in summer, he stood there clothed in green dark-green foliage, the people that saw him said, "That is a beautiful tree!" and, next Christmas, he was the first that was felled. The axe struck sharply through the wood the Tree fell to the earth with a heavy groan, he suffered an agony, a faintness that he had never expected, he quite forgot to think of his good fortune he felt such sorrow at being compelled to leave his home, he knew that he should never see again those dear old comrades, or the little bushes and flowers that had flourished under his shadow, perhaps not even the birds. Neither did he find the journey by any means pleasant.

When the Tree first came to himself he was in a large, handsome saloon. Pictures hung on the walls, and on the mantelpiece stood large Chinese vases with lions on the lids, there were rocking-chairs, silken sofas, and tables covered with picture-books. The Fir-tree was planted in a large cask filled with sand, and hung with green cloth, and placed upon a carpet woven of many gay colours. Oh, how the Tree trembled! What was to happen next? A young lady, assisted by the servants, now began to adorn him.

Upon some branches, they hung little nets cut out of coloured paper, every net filled with sugar-plums, from others gilded apples and walnuts were suspended, looking just as if they had grown there, and more than a hundred little wax tapers, red, blue, and white were placed here and there among the boughs. Dolls that looked almost like men and women seemed dancing to and fro among the leaves, and highest, on the summit, was fastened a large star of gold tinsel.

"This evening," they said, "it will be lighted up."

"Would that it were evening!" thought the Tree. "Would that the lights were kindled, for then—what will happen then? Will the trees come out of the forest to see me? Will the sparrows look in through the window-panes?"

At last the candles were lighted, and then, suddenly, both folding doors were flung open, and a troop of children rushed in as if they had a mind to jump over him; the older people followed more quietly. The little ones stood quite silent, but only for a moment; then their jubilee burst forth, and they shouted with joy till the walls re-echoed.

The children danced and played about with their beautiful playthings, and no one thought any more of the Tree except the old nurse, who came and peeped among the boughs, but it was only to see whether, perchance, a fig or an apple had been left among them.

"A story! A story!" cried the children, pulling an old man towards the Tree.

And then the old man told the story of Humpty Dumpty, who fell downstairs, and yet came to the throne and won the Princess. And the children clapped their hands. The Fir-tree stood, meanwhile, quite silent and thoughtful, the birds in the forest had never related anything like this. "Humpty Dumpty fell downstairs, and yet was raised to the throne and won the Princess!" "Ah, ah! Who knows but I may fall downstairs and win a princess?"

In the morning the maids came in.

"Now begins my state anew!" thought the Tree. But they dragged him out of the room, up the stairs, and into an attic-chamber, and there thrust him into a dark corner where not a ray of light could penetrate. "What can be the meaning of this?" thought the Tree. And he leant against the wall, and thought, and thought. And plenty of time he had for thinking it over, for day after day and night after night passed away, and yet no one ever came into the room. At last somebody did come in, but it was only to push into the corner some old trunks, the Tree was now entirely hidden from sight and apparently entirely forgotten.

"It is now winter," thought the Tree. "The ground is hard and covered with snow, they cannot plant me now, so I am to stay here in shelter till the spring. I only wish it were not so dark and so dreadfully lonely! Oh, how pleasant it was in the forest, when

# THE OLD MAN TOLD THEM THE STORY



The old man told the story of Humpdy Dumptyp who fell down and got stuck in the ground and was the  
 Precious And that's how they got their hands. The 11 new story, tomorrow, will be about the

the snow lay on the ground and the hares scampered about!"

"Squeak! squeak!" cried a little mouse, just then gliding forward. Another followed, they sniffed about the Fir-tree, and then slipped in and out among the branches.

"It is horribly cold!" said the little mice. "Otherwise it is very comfortable here. Don't you think so, you old Fir-tree?"

"I am not old," said the Fir-tree; "there are many who are much older than I am."

"How came you here?" asked the mice, "and what do you know? Tell us about the most delightful place on earth. Have you been into the store-room, where cheeses lie on the shelves, and bacon hangs from the ceiling, where one can dance over tallow candles, where one goes in thin and comes out fat?"

"I know nothing about that," said the Tree, "but I know the forest, where the sun shines and where the birds sing!" and then he spoke of his youth and its pleasures. The little mice had never heard anything like it, they listened so attentively and said: "Well, to be sure, how much you have seen! How happy you have been!"

"Happy!" repeated the Fir-tree, in surprise, and he thought a moment over all that he had been saying. "Yes, on the whole, those were pleasant times!" He then told them about the Christmas Eve when he had been decked out with cakes and candles.

"Oh," cried the little mice, "how happy you have been!"

The next night, the little mice came again and brought with them four other little mice, who also wanted to hear the Tree's history, and the more the Tree spoke of his youth in the forest, the more vividly he remembered it, and said "Yes, those were pleasant times! But they may come again, they may come again!" Humpty Dumpty fell downstairs, and yet, for all that, he won the Princess, perhaps I, too, may win a princess", and then the Fir-tree thought of a pretty, delicate little birch-tree that grew in the forest, a real princess, a very lovely princess was she to the Fir-tree.

"Who is this Humpty Dumpty?" asked the little mice. Whereupon he

related the tale; he could remember every word of it perfectly; and the little mice were ready to jump to the top of the Tree for joy.

But, at last, the little mice all scampered away, and the Tree sighed. "It was pleasant when they sat round me, those busy little mice, listening to my words. Now that, too, is all past! However I shall have pleasure in remembering it, when I am taken away from this place."

But when would that be? One morning, people came and routed out the lumber-room, the trunks were taken away, the Tree, too, was dragged out of the corner; they threw him on the floor, but a servant picked him up and carried him downstairs.

"Now life begins again!" thought the Tree. He felt the fresh air, the warm sunbeams—he was out in the court. The court joined a garden. Everything was so fresh and blooming, the roses clustered so bright and so fragrant round the trellis-work, the lime-trees were in full blossom.

"I shall live! I shall live!" He was filled with delightful hope, he tried to spread out his branches—but, alas! they were all dried up and yellow. He was thrown down upon a heap of weeds and nettles. The star of gold tinsel that had been left fixed on his crown now sparkled in the sunshine.

Some merry children were playing in the court, the same who, at Christmas-time, had danced round the Tree. One of the youngest now perceived the gold star, and ran to tear it off.

"Look at it, still fastened to the ugly old Christmas Tree!" cried he, trampling upon the boughs.

And the Tree looked on all the flowers of the garden, and wished from his heart that he had been left to wither alone in the dark corner of the lumber-room. He called to mind his happy forest life, the merry Christmas Eve, and the little mice who had listened so eagerly when he related the story of Humpty Dumpty.

"Past! All past!" said the poor Tree. "Had I but been happy, as I might have been!"

And then the servant came and broke the Tree into small pieces, heaped them all up together, and set fire to them, and the poor Fir-tree was no more.



She heard a heavy door shut behind her, and jumped to one side, crouching down with her hindquarters, her tail pressed between her legs. The man holding her bridle spoke to her and stroked her. Then he called out "All right. Let her go."

There was a pause, then the noise of a chain sounded, and Diamond felt herself falling through the earth. Down and down she went, and, in her fear, she plunged to this side and that side, blowing great clouds of steam through her trembling nostrils, while a thick sweat broke out from her heaving flanks.

Someone came forward, took the rope from the man who had brought her down, and led her away.

Diamond felt less frightened when she saw another horse pulling a truck full of coal through one of the tunnels. She felt almost quite safe when she came to a stable where there were three other horses. The stalls were clean. There was plenty of straw about. The horses were well groomed and looked fat. They neighed a welcome to Diamond, and Diamond answered them.

She was given a handful of corn, but she was afraid of the manger and would



BLACK DIAMOND TOLD HER BABY ABOUT THE WONDERFUL WORLD ABOVE THE COAL MINE

"It's all right, Diamond," said the voice of the man, and his hand passed quietly over her neck and under her muzzle. When the bandage was taken off Diamond's eyes, she found herself in a perfectly black world, which was without grass or sky. She could see nothing. She could scarcely breathe. Then, as her eyes got used to this underworld, she saw that the place was a black tunnel, with walls, roof, and floor, and that, in the distance, a light was shining from a lamp.

She was led forward, and soon the light of many lamps fell on her, and she saw men moving, and heard the sound

of voices. Someone came forward, took the rope from the man who had brought her down, and led her away. Diamond felt less frightened when she saw another horse pulling a truck full of coal through one of the tunnels. She felt almost quite safe when she came to a stable where there were three other horses. The stalls were clean. There was plenty of straw about. The horses were well groomed and looked fat. They neighed a welcome to Diamond, and Diamond answered them. She was given a handful of corn, but she was afraid of the manger and would not eat. The man brought some hay for her rack, but she started away from it. Then the man said "Diamond, my dear lady, a man and a horse can get used to anything. You'll get as used to eating food underground as above ground, see if you don't." He began to pass a hay-wisp over her, and while he did so he said. "Now, just you listen to me, my pretty. I'm called William—that's the name you'll have to call if you want anything; just you say 'William,' and I'll be round in a second, my name's William, and I've been here a matter of seven and thirty years, and I never

yet handled a horse that didn't get to love me. You've got to love me. I'm going to change your name to begin with and call you Black Diamond because you'll be dealing in black diamonds for the rest of your days.

Now it's a bit stuffy down here. I admit and the dark tries the eyes and you can't help missing the bird and the trees and the grass and the skies and the rivers and the sight of children. But for bless you Black Diamond we can't all have the best of things. Some must live in palaces and others in coal mines. Some must sail ships across the sea and others must look after poor men in prisons. Some must go fighting and others must sell woollen stockings. If everybody had everything there'd very soon be nothing for nobody. And come to think of it my lass, you're a deal better off down here with old William than you would be pulling a cab through the streets of London or standing for an hour at a time in the rain outside Cardiff Station.

Now isn't that true? Come taste the coats out of my hand and see how good they are. You and I are going to be friends, we've got to be friends. Black Diamond. So let's begin at once and enjoy ourselves.

But a Diamond I found that the love  
of the miner does make up in some  
measure for the loss of sunlight and

## IDUNA AND THE

In the ancient days the Finns  
people lived in a country between  
Denmark and Germany. They were

that a fierce race of alien warriors  
 and seafarers. They loved the sea and  
 little in this world of adventure and  
 they wearing a savage dress of  
 the sea and war. It is said they  
 were gentle and mild and seemed to  
 love peace they loved to hear of  
 about leave them and hear of the sea  
 and I select the release of them  
 in the time they used to be a  
 the sea and the sea and the sea

[illegible]

heaven's sweet air. She grew to love her friend William. She pulled the cart-trucks through the black mud and scarcely noticed that he was a man, gradually, gradually blind. With him brought her apples and carrots in his coat pocket and the other miners made a pet of her and he was soon a favourite with the other horses in the stall. A pit's a poor place to live in, reflected Black Diamond, but it's wonderful what a little love will do.

She worked grandly. She ate heartily. She slept soundly. But she was going gradually, gradually blind.

Then her foal was born and the miners called it Little Diamond and Black Diamond grew very happy thing the Black baby all about the wonderful world above the coal mine. She had just sufficient sight for her baby and she would look it for hours with her poor fading eyes full of a great tear.

I like learning your stories and Little Diamond, but of course I don't believe they're true. They are only fairy stories about them?

And years afterwards even Phidias and his fellow came to think that the green earth which yielded a poet on any of his fatal days must be only a dream.

It is so difficult when one is born a  
theist in a culture in the dark to believe  
that is a little way ahead of the rest  
was it a book in sun's a little bit

## GOLDEN APPLES

and I talked with a girl  
I have wanted to meet and  
I am in

[illegible][illegible]

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 10



After they were married, they went to Asgard. The gods welcomed Iduna with joy, and she gave them some of her apples to eat, and they were filled with the gladness of immortal youth. Unhappily, an old and ugly giant, living in the bleak and wintry land of Thunder, heard of the arrival of Iduna at Asgard, and resolved to obtain one of her apples, so that he might eat it, and become young and beautiful. He seized one of the gods, Loki, who came near his domain, and held him a prisoner until he promised to bring Iduna to him. Loki returned to Asgard and found

apples of immortality to eat. They then began to search for her, and found that she was last seen walking out of the gate with Loki. The traitor then confessed, but promised to bring Iduna back if he were given a pair of wings.

His request was granted, and he flew swiftly to the land of Thunder, and there he found Iduna sitting very sad and lonely in a bare hut. Happily, the giant was away. But just as Loki began to carry Iduna back to Asgard, the monster appeared. He was very, very angry, as he had not succeeded in persuading Iduna to give him one of her



Iduna gave the gods some of her golden apples and they recovered their youth. This picture is reproduced from the painting by J. Doyle Penrose, with the artist's permission.

Iduna alone, Bragi having gone off alone on a long journey.

"Come with me, Iduna, out of Asgard gate, and I will show you a tree that bears golden fruit resembling your wonderful apples," said Loki.

Iduna followed him, and Loki led her to the giant, who carried her off to the land of Thunder. For some time, the other gods thought Iduna had gone on a journey with Bragi. But some weeks passed, and then hair began to turn grey, and their faces to grow white and withered, because they had no

apples. Putting on an eagle's dress, he rushed after the fugitives like a storm.

All the gods stood on the battlements of Asgard, anxiously watching the chase. Loki came along at a marvellous speed, but, as he neared the gate, the giant sprang upon him. He sprang too late, however, for the other gods came to the rescue, and slew him.

Iduna gave them all some of her apples, and they recovered their beauty and their youth, and soon afterwards Bragi returned, and sang a song of triumph, and all the gods were pleased.

# The Childs Book of NATURE



These two caterpillar of the silkworm moth, feeding upon mulberry leaves are shown eating silks.

## THE WONDER OF A PIECE OF SILK

If a boy had money enough he would like to buy his mother or his sister a silk dress for her birthday. Very pleased she would be to have it. But if he said to her, 'Here is a caterpillar gown for you she would be horrified and call him a dreadful boy. Of course a silk dress is not really a caterpillar dress but that would mean that the dress was made of caterpillars. But though this is not the case the material if it be pure silk comes entirely from the caterpillar only we call the caterpillar in question a silkworm. That is merely a way we have. We call the silk yielding caterpillar a silkworm and we call the bird giving leather of the country a glaucous. Many things go by wrong names in common speech and the result is that when we study natural history we are obliged to discover the true nature of the things we have so long known.

The material of the silk dress is that cut from them and it is very soft and smooth to the touch by a very small insect. The caterpillar and the silkworm are the same thing and the caterpillar is the young of the silkworm. The silkworm is the caterpillar that has spun its cocoon and is now a pupa. The caterpillar is the young of the silkworm and the silkworm is the pupa of the silkworm. The caterpillar is the young of the silkworm and the silkworm is the pupa of the silkworm.

extracted from his



of them would die. They depend upon us for their life and we depend upon them for our silk. We can make lovely scarves and suits from cocoon but we can make all sorts of things in the laboratory of the caterpillar but not all the wonderful things we can make a piece of silk. How came man, then to have these wonderful scarves? It was long ago and he came they to depend upon man for their life. It is a wonderful story and takes a long time to tell of years before Jesus was born.

It was three thousand years ago the Chinese first discovered the use of silk. They found that it could be woven into a cloth and they found that it was very soft and smooth. They found that the caterpillar of the silkworm could be kept alive in a cage and that it would spin a cocoon. They found that the cocoon could be opened and the pupa could be taken out and that it would spin a cocoon. They found that the cocoon could be opened and the pupa could be taken out and that it would spin a cocoon.

five thousand years ago the people in many countries are doing to-day, and all for the same purpose, that men and women may have silk to wear or to use for the thousand and one purposes for which this beautiful fabric is so much sought after. Let us see what this wonderful process of Nature that gives the world its silk is.

FOURTY THOUSAND EGGS THAT WEIGH ONLY AN OUNCE.

We must suppose that we are setting up for ourselves as keepers of silkworms. The eggs—the only things that we need—can be bought, and we can set to work to gather silk this very summer. It is better fun even than keeping ants for here we can see all that happens in the process. With how many eggs shall we start? A pound? No, not an ounce. They are so light that there are about 40,000 eggs of the silk moth to the ounce or about 100 to a grain. Of course, we must have a proper place in which to keep the eggs, a place in which we can be sure that the temperature will not fall below 62 degrees, nor rise higher than about 80 degrees. The heat may be increased as the time for hatching draws near, but it must never be more than 80 degrees. As a matter of fact, the lower the temperature so long as it is not lower than 62 degrees, the stronger and better the caterpillars will be.

For this reason we must have a place where we can have a little artificial heat. A conservatory is a good place, but we must talk politely to the man who stokes the furnace, or he may let the fire get too hot or fall too low, and so spoil our chance. Of course, thousands of poor people have bred silkworms who could never afford a greenhouse. How did they manage? Many of them have put the eggs carefully in a bag and carried the bag tied round their necks so that the warmth of their bodies might hatch the eggs.

#### WHEN AND HOW TO HATCH THE SILK-WORM'S EGGS

With ordinary care there is no difficulty about hatching the eggs. But we must be ready for the day when they do hatch. First of all, we must be sure to have a supply of leaves of the mulberry-tree ready. It is of no use our hatching the eggs if this tree is not in leaf. The caterpillars would eat

lettuce, but they would not be nearly so fine, nor would their silk be worth much, after a diet of this sort. The next thing is to see that we have ready a very thin card, or piece of paper, pierced by little holes, which may rest on a ledge in the box, over the eggs. The little caterpillars, as soon as they are hatched, will see the light through these holes, and will crawl towards the light through them. In doing so, they will scrape off the shells clinging to them, and so escape all risk of being killed by being unable to free themselves from the shells. The caterpillar of other moths, as soon as he is born, makes a meal of his shell, but the silkworm needs this little help.

Now comes the first enjoyment of silkworm rearing. We can have a great many in a single big cardboard box, but we must be careful that this does not become crowded, or there will be trouble when the time for cocoon spinning comes. Better have three or four big boxes, like those in which the tailor sends home our suits of clothes, than that the silkworms should suffer for lack of sufficient space. It is a great convenience that we may safely leave the box open. We could not do this with any other caterpillars, for they would escape.

#### THE LITTLE SILKWORMS THAT WILL EAT A FOREST OF LEAVES

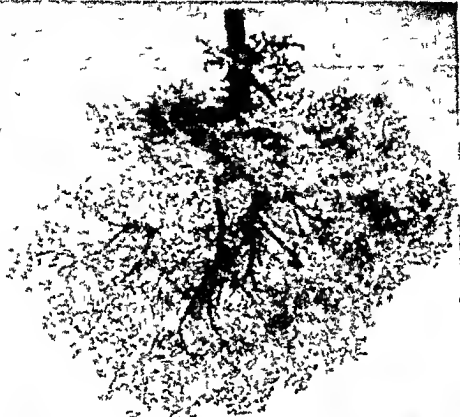
Not so the silkworm. It is as happy as can be in a box without a lid, provided that it has plenty of food and that the box is perfectly clean. Keep down the heat to as near 62 degrees as possible, and the silkworms will grow big and strong. They eat a surprising quantity of mulberry leaves.

We are not going to have a whole ounce of eggs, with 40,000 silkworms hatching out; but, in order that we may get an idea of the appetites of these insects, we will suppose for a moment that we have got this number. During the eight weeks that they live in the caterpillar stage, the 40,000 silkworms will require 1,362 pounds of mulberry leaves. Of this quantity, about 590 pounds will be wasted, for we take out all dry and stale leaves. But there remain 772 pounds to account for. That amount the caterpillars actually eat. We have to exercise care in the feeding, to distribute the food evenly, so that the caterpillars shall not have to struggle

# THE TREE THAT IS GROWN FOR AN INSECT



The heart-shaped leaves of the mulberry that do not open a full day provide good food for silkworms. And are very at active but it has a great use.



The mulberry is not just a common tree, but has been introduced to many parts of the world. It is a very useful tree, and its leaves are used for many purposes. The fruit is also eaten, and the wood is used for many things. It is a very important tree in many parts of the world.

and fight for their meal. A good way is to cut up the leaves small, as this makes the distributing easier. The pace at which the caterpillars grow is surprising. Like other caterpillars, they have to moult—that is, to cast their skin. The skin in which they are born does not last all their lives.

#### HOW THE LITTLE SILKWORM CHANGES ITS SKIN AND GROWS BIG

When they are about six days old, they cease to feed. The skin splits down the back and the caterpillar crawls wearily forth, bearing his new skin about him. His appetite returns, and he eats more heartily than ever. He grows rapidly when the new skin is still soft. But, after a few more days, another new skin is required, and after that a third, and finally the fourth.

Each moulting time is a period of serious trial for the silkworms, and many die during its progress. Once the last moult is over, however, the caterpillar eats away as if it knew that its days for feeding were numbered. By this time it has become one of the biggest of all our caterpillars. Whereas it was at birth only a speck, weighing the hundredth part of a grain, it has now increased its weight to about 95 grains, and its length to three inches or thereabouts, which is a very rapid growth for two months. Now comes the most important time of the caterpillar's life. It has to become a chrysalis, and it is in order that it may safely pass through the chrysalis stage that it spins the famous silk.

All the time that the silkworm has been growing up, it has been forming and filling two large vessels, or, so to speak, run along the sides of its body. Of course, these two sacs is stored up with a sticky fluid. In the state in which it is while still in the body of the caterpillar—we should not have the least idea as to what it was.

#### THE STICKY STREAM THAT BECOMES A STRAND OF GLOSSY SILK

That sticky stuff in the body of the caterpillar is to become the marvellous silk which makes the insect so valuable. When it is about to spin, as we call it, As we watch, we see two tiny streams issue from its lower lip. That is the spinnerets, or seripositors. It is as well that we should know the names, so that we may not

have to puzzle when we meet them elsewhere. We must remember, too, the scientific name of the silkworm. It is the *bombyx mori*. Well, then, the *bombyx mori* begins to spin its cocoon by producing two tiny streams of silk from its spinnerets, or seripositors. The sticky fluid, if we force it from the body of the silkworm, becomes hard at once, but, manipulated by the silkworm, it is drawn out into beautifully fine strands of silk. The two strands are joined together by the silkworm to form one thread, and it is only by the aid of the microscope that we are able to discover that there are two in the thread. With this material, the silkworm weaves itself the loveliest house of silk.

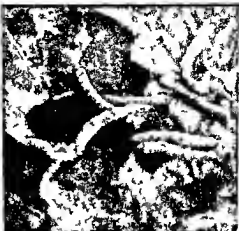
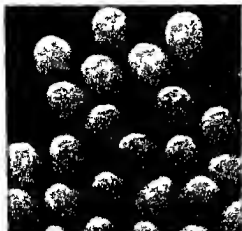
The work may take two, three, four, or even five days. Little by little, the silkworm builds up this castle of silk, weaving it so perfectly that at last the worm is entirely shut in and quite invisible. All the time that it is thus building, the silkworm works its head round and round in a regular order, never wearying. And all the time the silk never fails.

#### A Dainty GLOBE OF SILK THAT LOOKS LIKE A FAIRY EGG

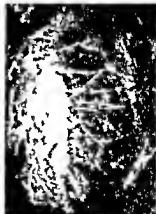
The silkworm, at the beginning of the task, weighs over 90 grains. When the labour is ended the silkworm, with its cocoon, weighs only about 50 grains. And there it is in a lovely globe of tightly woven silk, looking like some fairy pigeon's egg. The cocoon may be either white or pale yellow. Having watched the spinning, we realise why we ought to be careful that the silkworms have plenty of space. If they are at all cramped, two will spin together only one cocoon, and this will be useless.

If we leave the cocoons alone, there will come forth, in about fifteen days or three weeks, a pretty moth from each. The average length of the moths is about an inch, but the males are slightly smaller than the females. They can be kept on a cloth. They eat very little, sometimes even nothing at all. They sing as birds mate. The females lay several hundred or more eggs, and then die, and their wives do not live long after them. The male lives as long as the female, but a few from 5 to 10 days, that time, they never try to fly. The females cannot fly at all; their wings are just enough power in their days. In the day themselves in descending, fly away. The males fly upwards, but they cannot

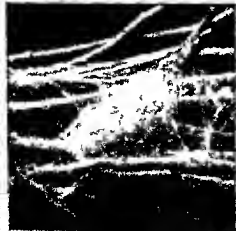
# THE SILKWORM AND ITS GLOSSY CRADLE



The silkworm's eggs here magnified many times are like tiny round spheres. First bright yellow and then become greenish grey their principal food. They are left near a leaf.



It may found a suitable place in which to spin its cocoon, or being provoked by the silk to move with a purpose for the purpose the worm spins its silken bed. seen in these pictures, that how these of go with work.



It is a very small creature, and because of its size the cocoon is very small and delicate. It is a very small creature, and because of its size the cocoon is very small and delicate.

In this, we see the result of thousands of years of care and attention on the part of man. The *bombyx mori* has always been the one species common everywhere as man's silk producer. Certainly, there are others in captivity in China and Japan, but they are not of much importance. At any rate, in Europe we have never been able to do much with them. There are wild silkworms, too, but their silk is of little use to men, so there has been no attempt to cultivate them. Those that have been allowed to remain wild can fly about as well as any other moths. Only those that have been cared for by man have given up the power to fly. If they could fly, they would fly away, and we should never know where to look for their silk.

So far, we have traced the silkworm from the egg to the caterpillar, and from the caterpillar to the moth. What of the silk, of which we have talked so much? Here we come face to face with a little tragedy. For every silk dress that is made means the death of thousands of silkworms.

#### WHY THE SILKWORM MUST DIE IN ORDER TO GIVE US SILK

That sounds dreadful, but it is not so in reality. The life of the silkworm, as a silkworm, is ended when the insect has reached the chrysalis stage. It is then in a state of torpor, and can have no sense of feeling, unless time and care are given to rousing its sleeping energies to a sort of wakefulness. That is not done. When the cocoons are all ready, we have to decide how many moths we want to renew our supplies of eggs. We take away those for the nursery. The others we want for silk.

These we plunge into scalding water. Manufacturers steam them, or submit them to a high dry heat. This kills the chrysalis. The reason why this has to be done is, that if life remained in the chrysalis, the latter would turn into a moth, and would then form an opening at one end of the cocoon out of which to creep, so spoiling the cocoon.

The next step is to wind the silk on to reels. To do this, the cocoon has first to be softened in warm water of from 75 to 85 degrees. The water dissolves the gum that binds the silk together. A neat-handed girl then twirls the cocoons about with a light brush, that catches the loose ends and causes them gradually to

unwind. All that we have to do is to undo the work that the caterpillar did. But the silk is far too fine to be wound in this state. In the thinnest part, the silk is so fine that 1,000 strands of it, laid side by side, would cover only an inch, while, in the thickest part, from 600 to 700 strands would be required to make up an inch in thickness.

#### SOMETHING THAT THE WISEST MAN CAN DO NO BETTER THAN A BOY

So, when the ends of the silk are discovered, the operator joins four or five together, passes them through a fine eye of glass, or polished metal, in a winding machine, and, letting the cocoons remain in the water, winds away until all the silk that can be used is wound out from each cocoon. The silk is wound on to a big wheel, and care has to be taken to see that the strands do not stick together. In Eastern lands and in some parts of Europe, machinery so simple that a boy could make it is used, but in big factories they have much improved on this. Still, the principle is everywhere the same, and at this stage the wisest man in the world could do no better than any ordinary boy or girl who has had a little experience with the winding.

Once the silk is freed from the cocoon and wound on to wheels, or whatever they may be, it is ready for the manufacturer. Many processes follow. The silk has to be freed from all the gum remaining on it, for at present it has no lustre such as we expect silk to show. It has to be cleansed by boiling, to be scoured, and purified by acids. That is one way. Another is to let the silk begin its own purification by a process of fermentation, which means the shutting up of the uncleaned silk in tanks containing soapy water, in which the silk may lie for weeks. Then follow all sorts of washings, and finally a drying.

#### HOW THE TANGLED SILK IS COMBED STRAIGHT BY A WONDERFUL MACHINE

Then we have the silk clean but terribly entangled. Wonderful machinery combs out the tangle, and makes all the strands of silk straight, and smooth, and even. Finally the silk is ready to be made up into dress materials, or into whatever may be required, just as if it were wool or cotton. A garment of pure silk lasts a very long time, for there are very few things that wear better. Unfortunately, some

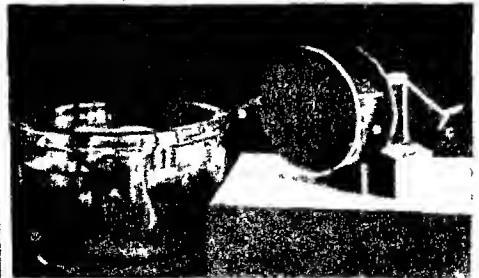
# HOW THE SILKWORM GIVES ITS SILK



Having spun its cocoon, the silkworm, which is not really a worm, but the caterpillar of a moth, has gone into a chrysalis or pupa. On the left we see a cocoon cut open, showing the pupa and the old skin of the caterpillar and the right is a number of pupae that have been removed from the cocoons.



The picture on the left shows some cocoons with the coarse outside silk that is known as bombyx removed. These cocoons are now ready to have their silk wound off into skeins, and we see a completed skein on the right.



The pupa is wound from the cocoon left, through the spinner at a very rapid rate, and after it is spun the thread is put on a reel. The thread is then wound on a spool. The thread is then wound on a spool. The thread is then wound on a spool.



manufacturers have discovered a way of adulterating it while the cleaning process is being carried out. They add salts of metals that are absorbed by the silk. This adds weight to the silk, and makes it appear a fine heavy fabric. But silk made by such dishonest methods soon rots. It is this adulteration that makes silk "cut" so readily, and makes a silk garment, or silk umbrella, become full of slits even when it is not much used.

#### HOW SOME STOLEN EGGS GAVE EUROPE SILK FOR 1,300 YEARS

It is very wonderful to think that all the millions of silkworms that for 1,300 years produced the silk upon which England and the whole of Europe mainly depended came from the batch of eggs stolen by two monks from China. So, however, it is. The art of making silk began, as we have seen, in China. The Chinese guarded their secret as closely as they could. They thought it good that their people should know how to make silk, but they did not want people in other countries to know how to do it. If other people wanted silk, they must buy it of the Chinese, not make it for themselves. They sold a good deal to Rome, for Rome in all her glory could not produce silk for herself. This state of things lasted until 550 years after the birth of Christ. Then the wise emperor, Justinian, who ruled in Constantinople saw how important was the silk trade, and determined that he would create a trade in silk for the Roman Empire.

Two Persian monks, who had long lived in China, told him that they had seen the whole process of rearing the silkworms, and the manner of treating the silk. So he sent them secretly to China to get him some eggs of the silk moth. They walked all the way from Constantinople to China, and they walked back again, but they brought with them some of the precious eggs.

#### THE SILKWORM'S EGGS THAT CAME TO EUROPE IN A BAMBOO STICK

It would have cost them their lives, had the purpose of their visit been known. They knew this, and were very careful. They got a supply of eggs of the silk moth, hid them in a hollow bamboo and then carried them to Constantinople and presented them to the Roman emperor, who ruled in what is now the capital of Turkey.

The emperor was delighted. The eggs were hatched, and there appeared, for the first time in history, a number of silkworms in Europe. From each female moth he would get 500 or more silkworms, and from these in turn there would be another great increase. The monks had brought him, in the little bamboo nest of eggs, the richest goldmine that they could have given him.

The emperor caused a silk factory to be set up in his royal palace. Only those whom he appointed—trusty women, who worked under the direction of the monks—were allowed to manufacture silk. But, in course of time, the eggs of the silk moths were carried to other countries. In Italy and France many towns became famous for their silk manufactures. Frenchmen, persecuted on account of their religion, fled to England, and brought with them the secret of manufacturing silk. That secret gave vast riches to our country, though we ourselves had to buy our raw silk from France and Italy.

#### MILLIONS OF POUNDS LOST THROUGH A DISEASE AMONG THE SILKWORMS

Our kings tried by every means in their power to get the cultivation of the silkworm taken up in our colonies, but it was never successful. Still, the manufacture of silk into articles of use became very important to us at home. It was still more important to Europe. We may gain some idea of its importance from what happened when a terrible disease broke out among the silkworms of Italy and France during the second half of the nineteenth century. In spite of the disease, there were always some healthy caterpillars producing silk, and the trade never came to a standstill; but the damage done to that part of the trade which failed robbed France and Italy, in only thirteen years, of £120,000,000.

It was only then, after all those centuries, that Europe had to send again to the East for more eggs of the silk moth. During 1,300 years Europe had been stocked with its millions and billions of silkworms from the descendants of those silkworms which came from the eggs carried away in a little bamboo by the two monks at the command of Emperor Justinian.

The next story of Nature is on page 367.

The Child's Book of  
ALL COUNTRIES



This photograph of the sun shining at midnight was taken in Norway when it was night day.

## NORWAY, SWEDEN, & DENMARK

Once upon a time the very far-off time when the British Isles formed part of the continent of Europe the great Alpine heights were linked with the Northern Sea by a river much longer and fuller than the Rhine is now for its mouth was between Scotland and South Norway.

Asares went on the land rose though not very much as we read in the story of Holland and Belgium but enough to give shape to the shallower North Sea more or less as we find it now washing the shores of East Prussia, Holland and Denmark.

Denmark is one of the very few  
peninsulas in the world that point  
towards the sea. Its surface is flat in  
most parts it has to be protected from  
the sea by dykes as in the case of  
Holland. The water is 10 to 15 feet  
deep. It has steep mountains to the  
west and north of North Sea which  
is more than 1000 feet high. The  
land is low. This is called the  
Sjælland. It is a large island which  
is separated from the sea by a narrow  
strait called the Little Belt. The  
strait is 10 miles wide. The water  
is 10 feet deep. The water is 10  
feet deep. The water is 10 feet  
deep. The water is 10 feet deep.



numerous rivers all  
like draining east  
ward to the Baltic  
and a steep slat  
to the Atlantic. The Baltic  
has been called the "Medi-  
terranean of the North"  
so useful it always  
been a highway of com-

for the people dwelling on its slopes. The mountains divide the country into two distinct countries - Sweden to the east and to the west. Norway being like a bag on the shoulder of Sweden.

In the Prehistoric Room at the British Museum is to be seen part of a kitchen dustheap from the time of the early days of the Iron Age. It contains a lot of broken pottery, bones of food, and a lot of other things. It is a good example of the kind of things that were found in the early days of the Iron Age.

From 1911 to 1913, the following were the  
 names of the persons who were elected to the  
 office of the President of the Board of  
 Directors of the City of New York:

Europe, others pressed on to the peninsulas and islands of the North, gradually driving the older peoples whom they found there—the Finns and the Lapps—farther and farther to the frozen North, where their descendants are found to this day in Finmark and Lapland, between the head of the Baltic, that is called the Gulf of Bothnia, and the Arctic Ocean.

#### HOW THE NATIONS OF SCANDINAVIA GOT THEIR PRESENT NAMES

The newcomers, who became known as Scandinavians from the name of a province, Scanea, settled in what is now the extreme south tip of Sweden; and the names of Swedes, Danes, and many others come from the leading tribes that settled in various parts. The name Norsemen, or Northmen, comes from the position of the country in which these hardy folk found their home, in the north-way between ocean and mountain.

The Romans, as we have seen, did not push their conquests farther north than the mouths of the Rhine, and any Roman remains found in Scandinavia were carried there in the course of trading. And so all the long years when the Romans were setting in order Gaul, Spain, Germany, Britain, and leaving lasting traces in these countries, the Scandinavian peoples were working out their own development in their own way, in the fertile fields of Denmark, on the peninsula of Jutland and the neighbouring islands, by the grand, clear lakes and rivers and the boundless forests of South and Middle Sweden; and round the wonderful inlets of the sea in Norway, called fjords or fiords, like the firths that we know so well in Scotland.

#### THE NORTHMEN, WHO THOUGHT THUNDER WAS THE PASSING OF THEIR GOD

The religion of the Scandinavians was much like that of our own forefathers, their next-of-kin. Like them, when they saw the bright rainbow in the sky, they believed it was the bridge by which the gods rode to their home, Asgard; and when they heard the roar of the thunder, it was to them, Thor the Strongest rattling past on his cart or banging his great hammer. Like the Angles and Saxons, too, they believed that the great All-Father Odin, or Woden, received all slain in battle to feast for ever in his great hall, Valhalla.

For war was their principal occupation, and the chiefs went on fighting each other for possession of desirable tracts of land that gradually grew into small kingdoms. At last, towards the close of the eighth century, some 300 years after their cousins, had migrated across the sea to Britain, a sudden activity stirred in the hearts of the dwellers of the fiords, and some of their neighbours in Denmark or Sweden. It seemed as if they were tired of fighting each other, and longed for a wider field for adventure and glory. And so the Norsemen burst like a destructive tempest over lands, by this time somewhat civilised and Christianised, on the coasts of Ireland and Scotland, on the groups of islands near them, and on the coasts of England and France.

"From the rage of the Norsemen, deliver us, O Lord!" was the prayer that rose up from far and near, as churches and farms were burnt, and people were killed or enslaved, while their worldly goods were carried off to the ships of the Vikings, the fierce men who lived by the creeks or fiords.

#### THE STIRRING STORIES AND INSPIRING SONGS OF THE VIKING HEROES

For a time they were content to depart with their booty, returning year by year for more; and then they began to settle in the attacked countries. We see in the story of France, beginning on page 2193, how Rollo founded Normandy, and how sadly Charlemagne watched the Norsemen in the Mediterranean. Other Norsemen settled in Iceland, and the islands to the north of Scotland, and in Ireland, where their descendants are still known by their Scandinavian names and appearance.

Beyond once sailing up the Thames, the Norsemen seem to have left England chiefly to the Danes, about whose struggles with Alfred we read on page 512. The stories of these times are related by poet-historians, whose writings, or sagas, have been handed down, and collected, and greatly studied. They give so many particulars of vivid scenes and stirring conversations between the heroes, of their garments and songs, of their bravery and feasting, that they make the wild old times live again, those times when the rusty old swords and spears we see in museums were new.

# THE HERO-KINGS WHO MADE SWEDEN GREAT



Gustav V. the first of Sweden, a crowned king in 1523, and under him Sweden became Protestant. He was a good king, hated drink and was of good memory and did much to thrive the people. In the picture, by the famous Swedish artist Salomon, we see him engaged in his coronation. He was suddenly upon a drinking party of his subjects, and he with his sword destroyed the



few days after the coronation of Gustav V. the first of Sweden. He was a good king, hated drink and was of good memory and did much to thrive the people. In the picture, by the famous Swedish artist Salomon, we see him engaged in his coronation. He was suddenly upon a drinking party of his subjects, and he with his sword destroyed the

and bight, and the drinking-horns, which could not beset down till they were empty, were filled, again and again, at feasts where the warriors "tumultuously rejoiced", and the combs were used to straighten the flowing locks of the Free-men. There is one of these combs at the British Museum with the inscription 'Thorfast made a good comb.'

#### THE TERRIBLE NORSEMAN, WHO BROUGHT NEW LIFE TO THE OLDER NATIONS

These Northmen, terrible as were their descents on the countries they attacked, infused a breath of new life into them which has lived on. They had a wonderful power of adapting themselves to the manners and speech of the people among whom they settled. In Normandy the Northmen became French. In England we know how the Danes mingled with the English.

In the meantime, in the big and little peninsulas, and on the islands between them, the three kingdoms were gradually setting down, and for about four centuries, from the tenth to the fourteenth, they kept fairly distinct and independent of each other, though for a time the kings of Denmark, Sweyn and his son, Canute the Mighty, were practically emperors of the North, ruling not only over Denmark, Norway, and part of Sweden, but, as we read on page 516, over England across the sea.

Sweyn's father had adopted Christianity for Denmark. In Norway, about the same time, there were two kings named Olaf, whose doughty deeds forced Christianity on their unwilling people. The second Olaf, with the flaming red beard, is St Olaf, the great hero of Norway, for his adventurous life, and still more his tragic death, took firm and lasting hold of the imagination of his fierce countrymen.

#### OLAF, THE HERO-KING OF NORWAY, WHO FACED THE ANGRY PEASANTS

After helping Ethelred of England against the Danes, he bided his time till he could establish his claims to his father's throne. Facing the angry peasants, who objected to his reforms, he struck down their idol with his club, and after many and wonderful adventures, amid loud battle-cries of "Forward, Christ's men, Crusaders, the king's men!" and "Forward, forward, peasant men!" Olaf fought his last desperate fight on August 31, 1030. The date is fixed,

because as the king died there was a total eclipse of the sun, terrible to the peasants, who thought it a sign of God's anger. St. Olaf was buried at Nidaros, at the mouth of the Nid, on the Trondhjem Fiord.

It was in the days of the Olafs that Leif the Lucky sailed away to the West, and first showed Greenland and the shores of North America round the mouth of the St. Lawrence river to Europe.

Another name stands out in these early days—that of Sverre, who led the Buchlegs, so called from the baik they bound round their legs, against the Baglers, who represented the Church and nobles, in wild contest for the kingdom. The bravery of Sverre and his Birchlegs was splendid, the old historians tell us how Sverre put down the nobles who oppressed the people, and how he maintained law and order, after long and fierce fighting by sea and land, between the old towns of Bergen and Nidaros. The Pope excommunicated him, but Sverre defended himself.

#### THE CAPTIVE CHIEF WHO TOLD A DYING KING THE WONDERS OF THE EAST

The Bagler chief with whom he last fought had been on a crusade to Constantinople and Jerusalem, and when the two, both ill, were lying side by side on the ship's deck that was taking them to Bergen, as they gazed at the clouds fleeing across the wintry sky, the conquered Bagler told his conqueror, Sverre, about his wonderful adventures in the East, and of the glories of Constantinople. Sverre died on landing. He was one of the greatest kings that ever ruled over Norway.

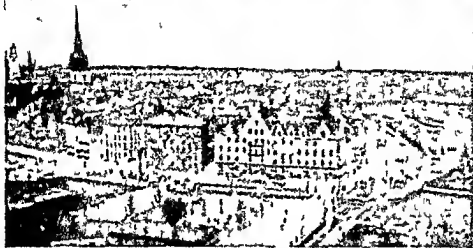
Two centuries after his death, all three kingdoms were united for over 150 years under the rule of Denmark. This time was marked by many struggles among the three kingdoms and also by wars with the Hanseatic League, which had become very powerful. Besides stations in Germany, the League had several in Scandinavia.

Norway suffered terribly from the plague called the Black Death, brought by an English merchant to Bergen. Whole populations were swept away, and centuries passed before the country fully recovered from the loss to trade, and agriculture, and progress. Sweden broke away from the Union of Calmar, as it was called, when its great king

# THE THREE CAPITALS OF SCANDINAVIA



Christiania, the capital of Norway, named after King Christian IV, who found it in 1624 is situated in a beautiful scenery. It is of great importance every day. This view of the city is taken from the king's palace.



Stockholm, the capital of Sweden, is built upon islands and houses upon a island in sound. For several months every year the harbor is closed by ice. In this picture, showing the Slottet Bridge, we are looking south.



Copenhagen is one of the finest seaports on the Baltic Sea and is one of Copenhagen on the harbor of the harbor. It is a very beautiful harbor and is the city of the harbor in Denmark.

Gustavus Vasa rose to power. The union between Denmark and Norway went on for another 300 years. During this time Norway may be said to have no history. It was miserably oppressed and powerless. For in Denmark, for some time, the king was but the fool of the nobles, who ruled as they chose in both kingdoms. In the year of the Spanish Armada, 1588, King Christian IV became King of Denmark and Norway, and during his long reign matters considerably improved.

Christian IV was a very energetic king, and travelled over his kingdom right up to the Arctic Circle, punishing officials who were doing wrong. He found time, too, to visit at Greenwich his sister Anne, who married James VI of Scotland, afterwards James I of England. His portrait hangs at Hampton Court. He was also a great builder. Christiansburg, now the capital of Norway, and Christiansand, a port on the south of Norway where many steamers touch, were founded by him.

#### THE WEALTHY NOBLES WHO REFUSED TO PAY THEIR TAXES

He had much trouble with the nobles of Denmark, who, though very wealthy, refused to pay their share of the taxes. When his son came to the throne, the Royal Council, composed very largely of incompetent nobles, was done away with, and the king became absolute, ruling without a constitution. Denmark lost that same year, 1660, the land she held in the south of the Scandinavian Peninsula.

The duchy of Schleswig, chiefly Danish, and the duchy of Holstein, chiefly German, to the south of the peninsula of Jutland—which had for years been shifting from one ruler to another—were at this time wholly united to the Danish crown. This period, while Denmark and Norway were united, was the time of Sweden's greatest glory, followed, unhappily, by a time when the gains of its hero-kings were nearly all lost again. Gustavus Vasa adopted the Protestant teaching of Luther. Though some people lost their lives, the changes in religion came about more quietly in the northern kingdoms than elsewhere. Gustavus Vasa's famous grandson, Gustavus Adolphus, was the "Snow king" of the Thirty Years War, and gained lands from Germany both on the Baltic

and on the North Sea. In the time of Charles XI., Sweden gained Livonia from Poland, and, as we have seen, extended her borders to the extreme south of the Scandinavian Peninsula, which gave her ports beyond the narrow entrance of the Sound to the Baltic.

#### THE SWEDISH KING WHO ASTONISHED THE WORLD BY BEATING THREE NATIONS

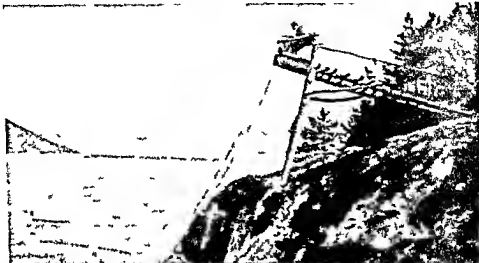
Charles XII won victories which astonished the whole world. Attacked by Denmark, Poland, and Russia, all at once, he beat all three, though at last he was defeated by the Russians. His reign was nearly all war, and the kingdom was taxed beyond its strength to provide men and money. Still, though it lost a great deal in later reigns, it has always kept its valuable gain from Denmark on the south of its own peninsula. Wars with Russia followed, and many revolutions took place, kings and nobles claiming absolute power in turn.

In the wars of Napoleon, Denmark had to be on the side of France, and in 1802 the English felt obliged to bombard Copenhagen and seize the Danish fleet. Sweden took the part of the allies, and its crown prince, Bernadotte, one of Napoleon's generals, led the Swedish troops against his old master when, in 1813, all Europe was struggling to regain freedom. When peace was made, it was arranged that Denmark should no longer be under Norway, but that the two kingdoms of the great Scandinavian Peninsula should be joined together under one king. To this the Norwegians strongly objected, they chose a king of their own, and set up the freest constitution that is possible with a king. In the end they had to accept the union with Sweden, joining as an independent kingdom, to be ruled according to its own free constitution.

#### HOW PRUSSIA SEIZED TWO PROVINCES THAT BELONGED TO DENMARK

Denmark still remained an absolute monarchy till the great revolutionary year of 1848, when Frederick VII. gave his people a constitution. There have been endless disputes about the two duchies at the base of the peninsula, and we see, on page 2639, how they were seized by Prussia, and on page 2750, how the great Baltic Canal was cut across Holstein, connecting the Baltic Sea with the North Sea.

# THE PEOPLE OF SCANDINAVIA AT WORK



The fjords of Norway with their deep waters and rocky walls, are a refuge for the salmon, and such sights as this are common. The fisher is sitting in a "crow's nest" built on a pole, from which he waits his long prey.



The people of Sweden make their bread in the form of flat loaves which they call "flatbröd" and which is the principal food of the people. In the picture on the left we see flatbread being made on the open fire and on the right a farmer's wife and daughter are making and baking some food; the kitchen of the farmhouse.



Swedish people are well known for their skill in catching fish. In the picture on the left we see a man and his son, and on the right a group of people are working together to catch fish in a body of water.



The Swedish crown has remained in the family of Bernadotte, who became king as Charles XIV., and improvements have been made in the Swedish constitution, and more freedom and liberty have been granted to other forms of religion besides the Lutheran.

**THE BRITISH PRINCESS WHO BECAME QUEEN OF AN INDEPENDENT NORWAY**

But Norway ever kept the vision of independence before it, and in 1905 succeeded in its aims and separated from Sweden, choosing for its king a Danish prince who has taken the name of Haakon, so full of associations with early Norwegian history. His wife is a daughter of Edward VII., and the little crown prince bears the revered name of Olaf.

And now all three Scandinavian kingdoms are as independent of each other as they were at the beginning of their history, there was a century and a quarter of the Calmar Union of all three, nearly three hundred years of union between Denmark and Norway, and nearly a century of union between Sweden and Norway.

Six hundred miles away from Norway lies the large island of Iceland, many times larger than Denmark, to which it belongs. Settled by Norsemen in very early days, it was a possession of Norway when that country passed under Denmark. When Norway was united to Sweden, Denmark kept Iceland. The climate is so cold, and it is so difficult to grow food, that there are very few people living there. Fishing is their chief occupation. Many visitors go in summer to Iceland to see the fine volcano, Mount Hekla, and the boiling springs, or geysers, near it. These are somewhat like those in New Zealand.

**THE BUTTER FROM DENMARK THAT WE SPREAD ON BREAD FROM CANADA**

Denmark owns, too, the mountainous Faroe Islands, midway between Scotland, Iceland, and Norway, where sheep feed, and wild birds circle round the tall cliffs, and the inhabitants live a primitive life. To Denmark itself, it is a very easy journey from England across the North Sea, to the chief western port, Esbjerg, and then by train across the green meadows of Jutland and the islands, and by boat across the arms of the sea that lie between them to Copenhagen, on the east coast of Zealand,

facing Sweden. This chief passage is called the Sound. Other passages are the Great Belt and the Little Belt, and lines of steamers are constantly plying between the islands and to the German coast, and by the great canal from Kiel Bay to the mouth of the Elbe.

Denmark is one of the most famous countries in the world for dairy farming; the meadows are so rich, and the people are so careful and up to date in their methods, that their butter is excellent. Large quantities are exported. Many Danes go to Siberia, where vast farms are gradually rising up over the country, giving us butter to spread on the bread grown on the wheat farms of Canada.

Copenhagen, the haven of merchants, has very fine harbours and quays, and has been the capital of Denmark for many centuries. The popular King Christian IV added greatly to its importance, and it has very interesting museums and picture-galleries. In the Danish Museum are collections of both prehistoric and historic objects, illustrating all time.

**A DANISH AUTHOR WHOSE TALES DELIGHT THE CHILDREN OF THE WORLD**

The porcelain factory is famous for its beautiful work. Among the statues of men held in remembrance by Denmark, such as Christian IV and Frederick VII., who granted the Constitution, is that of Hans Christian Andersen, the friend of children throughout the world, whose beautiful fairy stories have been translated into many languages.

Copenhagen and its surroundings are interesting to us as the early home of our queen. The Denmark monument, which commemorates the golden wedding of her father and mother, shows the widely-spread influence of their children in the courts of Europe. There is on it a picture in relief of the marriage of their daughter, Princess Alexandra, with the Prince of Wales, now Edward VII., another of the departure of their second son to ascend the throne of Greece as George I., another of the marriage of the Princess Dagmar with the Russian prince, afterwards Tsar Alexander III.

We cannot leave Denmark without a visit to its older capital, Roskilde. It is now an important railway centre. Of its ancient glory, the cathedral is the sole relic, containing the tombs of the Danish kings from the tenth century.

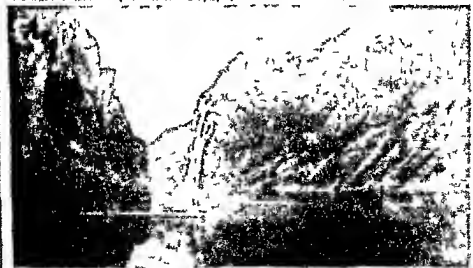
# THE GLACIERS AND FIORDS OF NORWAY



The famous Jostedal glacier in Norway after winning boat race with picture in a district of the waters of the Sogne Fjord, together with the lake and the thousand tons of ice and snow every day.



For snow and ice across Norway you will find it and though there is a lot of ice and snow in the glaciers form and they create a sharp peak, when in Norway they are not so high. In the middle hand picture we see a glacier on Lake Olen. It is a long and narrow glacier, and the right hand picture of the middle part of the glacier is a picture of the glacier in the middle of the glacier.



Norway is a great land of beauty, and the scenery is so beautiful that it is hard to believe. The first picture shows a view of the fjord, and the second picture shows a view of the glacier. The third picture shows a view of the glacier, and the fourth picture shows a view of the glacier. The fifth picture shows a view of the glacier, and the sixth picture shows a view of the glacier.

That of Christian IV is in a handsome chapel. It is but a short journey of three or four miles across the narrowest part of the Sound to the part of Sweden so long held by the Danes. Within view of the Swedish coast, a column on a hill is pointed out as the tomb of Hamlet. The story of this prince of Denmark was taken, as we know, by Shakespeare for one of his greatest plays.

#### A FAMOUS SWEDISH CANAL CUT OUT OF GRANITE BY A SCOTTISH ENGINEER

If we cross from Helsingor to Helsingborg, we can pass on to the mouth of the Gota Canal at Gothenburg, on the Kattegat, the chief western port of Sweden, and steam by it and the great lakes of Wener, Wetter, and Maelar right across the south of Sweden to Stockholm and the Baltic beyond. The journey can be done in twelve hours by rail, but the trip of two or three days by steamer is most interesting and delightful. The great kings of Sweden, Gustavus Vasa, Charles IX and Charles XII, all planned to build this canal, many of the locks of which are cut out of solid granite. It was a Scotsman, Thomas Telford, the great engineer, who helped so much in its completion.

This southern part of Sweden is the richest and most thickly peopled. In the clearings of the forests, crops such as rye, barley, oats, roots, and wheat are grown, and there is much dairy farming. North of the lakes of Wener and Maelar is the great iron-mining district. Swedish iron is particularly good for making steel, copper is abundant in the country, besides many other useful metals.

#### STOCKHOLM, THE VENICE OF THE NORTH, A CITY BUILT ON ISLANDS

Stockholm, the capital of Sweden, is most beautifully situated on islands, connected by bridges, in the short river which forms the outlet of Lake Maelar. It is often called the Venice of the North. Perhaps the splendid quays, where ships are constantly loading and unloading, first attract a stranger's admiration, but it is equally delightful to watch the little steamers carrying passengers, as omnibuses do in ordinary towns, or to sit in the open squares watching the bright and picturesque figures as they pass. The museums are very fine, too; we can see the shirt Gustavus Adolphus wore at Lützen, and many other relics of the hero-kings. The massive palace

is of great interest, also the church, with its iron spire 300 feet high, which has been the burial-place of the Swedish kings and heroes since the time of Gustavus Adolphus.

The Deer Park is the most beautiful of many parks in the neighbourhood, and the excursions all round Stockholm, on Lake Maelar and in other directions, are most charming. Dalecarlia, a district famous for its copper-mines, and its connection with the romantic story of Gustavus Vasa and his hairbreadth escapes, is also celebrated for the picturesque costumes of the peasants, whose snowy-white sleeves and black dresses, with stripes of bright colour on the skirts and aprons, look very gay when numbers are seen together, as on Sundays and holidays.

Upsala, to the north of Stockholm, is a famous university town, and great is the scene of excitement when degree day arrives. Hundreds of graduates, in their white caps, throng the streets.

#### THE LAND WHERE THE SUN SHINES ALL THROUGH THE NIGHT

The singing of the students' songs is superb. It was Gustavus Adolphus who endowed this university with his private fortune, and there are many interesting links with the past, from the old pagan days onwards, in this city so dear to the Swedes. Education is very advanced in Sweden, which is famous all over the world for its fine system of gymnastics.

If we are in South Sweden between June 17 and 21, we shall have no real darkness at night, only twilight for about three hours.

It is a fine trip of three days to steam to the north of the Gulf of Bothnia, from Stockholm, towards the land where the sun shines all night. If the wind is off the Swedish shore, forests of pine that bring such wealth to Sweden, and the meadows of endless farms, send their sweet fragrance out to sea. We shall see many fishing-boats along the shores and amongst the islands, and so many rivers glide into the sea, after their gentle journey from the snowy mountains, that the water becomes almost fresh, which is one reason why the Baltic is very ready to freeze in the winter—the ice is not all gone even in June. Sometimes saw-mills, farms, and villages come in sight, and the



stand out for size and grandeur, and for historical interest. They are Trondhjem, Sogne, Stavanger, and Christiania fiords. Trondhjem Fiord is very beautiful with its rich vegetation, and its town of Trondhjem, formerly called Nidaros. It is called the cradle of the kingdom of Norway. For here the kings of Norway have been crowned since early days. Here the famous Thing, or meeting of the people, took place, here St Olaf was buried, attracting hosts of pilgrims to his shrine. The cathedral of Trondhjem is the grandest of all the churches of Scandinavia.

As we see on page 3594, it was on the coasts between Nidaros, now Trondhjem, and Bergen that the great civil war raged in the time of Sverre. The Sogne Fiord, a little north of Bergen, is the longest of the Norwegian fiords, over a hundred miles, and bare rocks are succeeded by narrow banks of smiling fields and orchards, and these again by sheer heights over 5,000 feet, over which the rivers pour from above. The largest glacier in Europe is found at the head of the Sogne Fiord.

Bergen—the pasture among the mountains—besides being of great interest from association with the old kings who lived and fought in it, and from its connection with the Hanseatic League, is the greatest fish market in Norway. It is a grand sight when the first of the northern seafarers arrive with their early boatloads of fish and cod-liver oil.

Yet another great fiord is Stavanger, with scenery as grand as that on Hardanger. The town of Stavanger is very old, and has a fine cathedral, dedicated to St. Swithin, Bishop of Winchester. By the quays here, we see steamers from Newcastle, Hull, Rotterdam, and

Hamburg, besides the numerous boats that ply all along the coast, in and out of the fiords. For there are but few railway lines or good roads in these parts of Norway. The people go to church, to market, to school, all in boats.

Christiania, the capital of Norway, lies at the head of the beautiful fiord of the same name near the borders of Sweden, founded, as we see on page 3595, by Christian IV., near the site of the old town of Oslo, where his sister Anne married the Scotsman, afterwards James I of England. The trade of Christiania gives an idea of the resources and work of the country. From its docks

and quays are despatched timber and ice, packing paper and paving stones, besides herrings and beer. Engine works, nail factories, ship-building, cotton mills, are all busy and noisy round about the capital. Among the many interesting things to see in Christiania, illustrating the history of Norway and the life of its people, are the two Vikings' ships, in which the old chiefs had been laid to rest with their arms and treasures, just as the old Germanic kings were buried in their war chariots. With the actual

timbers—and the mast where the square sail was raised by a pulley, and the open spaces for the oars, all before us, it is easy to add in imagination the shining dragon's or bird's head on the prow, and the stalwart men with their flowing hair, and shining spears and shields, as they swept out of the beautiful fiords.

And the mothers and wives who watched them go? Stones are still found standing, on the breezy shores raised by them, with inscriptions to the son or husband who bravely sailed away, but returned not.

The next story of Countries is on page 3593.



## THE NOVELS OF THACKERAY

WE have read "The History of Arthur Pendennis" in which Thackeray gives us a picture of a young man's experiences before he settles down as the husband of a charming wife and father of a young family. Pendennis, it will be remembered is supposed to become an author in the story. Thackeray some five years later in 1853, began another long novel in monthly parts, and although his own name appears on it, he pretends on the title page that it is "edited by Arthur Pendennis, Esq." Its full title is "The Newcomes: Memoirs of a Most Respectable Family." By pretending that Arthur Pendennis tells the story the two novels are thus connected together in interest. Colonel Thomas Newcome is one of the most beautiful characters in fiction.

## THE NEWCOMES

**T**HERE are some  
natures that seem  
to grow a little sour with  
the passing of the years or at  
least tend to dryness and stiff-  
ness like an old tree while there  
are others that sweeten the older  
they grow. Lieutenant Colonel  
Thomas Newcome C.B. of the Bengal  
Cavalry was of the latter and better  
sort. Though at all times of his life he  
proved himself a true gentleman the  
beauty of his character was seen at its  
best towards the end of his days. The  
generous heart of youth was ever  
his he was as brave as he was  
tender and unselfish.

In those days of the late Georgian period when a journey to India was a very different matter from what it is today, the officers who served in our Indian Armies could not come home on furlough every few years. Colored New come indeed had left England as a youth and only found himself back in the Old Country after thirty, or even forty years of service. But the temptations of India then had lured him away had he not, months and the black and very only white. He is asked by a young man

The president's official statement that he would not be a candidate for reelection was a surprise to many. It was a surprise because he had been so popular and so successful in his first term. It was a surprise because he had been so young and so energetic. It was a surprise because he had been so confident and so determined. It was a surprise because he had been so brave and so bold. It was a surprise because he had been so wise and so just. It was a surprise because he had been so kind and so gentle. It was a surprise because he had been so strong and so firm. It was a surprise because he had been so brave and so bold. It was a surprise because he had been so wise and so just. It was a surprise because he had been so kind and so gentle. It was a surprise because he had been so strong and so firm.

The 1st Avenue was immediately  
 improved and the street light  
 to be put in the middle of the  
 road for a part of the year  
 and the 1st Avenue was  
 the 1st Avenue was improved

courtly and was his  
sincere thanks. Nay,  
he even searched out  
every child of his Indian friend  
that like Clive was in England  
for education. Ascertaining that  
his old nurse who had been one  
relative of his family was still  
alive he went many miles to visit her  
just for old times sake. Everywhere  
he went he seemed to shed some form  
of goodwill and kindness, and if there  
were any who did not love the cause  
it was because they themselves were  
unworthy of love.

His two stepbrothers, H. Lee New  
come and G. R. Brian New, are some  
members of this miserable gang.  
The confederate's own son, J. L. New,  
when he was but a child, and his step-  
mother both behaved so harshly to  
that it was largely an accident of the  
war that they went to a better home.  
New killed during the war, stayed in  
France and although still in the army  
returning to his old country, he was  
to be executed for some reason, and  
he was shot, but he was killed  
after the war was over.

History of the Church, 1847-1854, 1855-1860, 1861-1866, 1867-1872, 1873-1878, 1879-1884, 1885-1890, 1891-1896, 1897-1902, 1903-1908, 1909-1914, 1915-1920, 1921-1926, 1927-1932, 1933-1938, 1939-1944, 1945-1950, 1951-1956, 1957-1962, 1963-1968, 1969-1974, 1975-1980, 1981-1986, 1987-1992, 1993-1998, 1999-2004, 2005-2010, 2011-2016, 2017-2022, 2023-2028, 2029-2034, 2035-2040, 2041-2046, 2047-2052, 2053-2058, 2059-2064, 2065-2070, 2071-2076, 2077-2082, 2083-2088, 2089-2094, 2095-2100, 2101-2106, 2107-2112, 2113-2118, 2119-2124, 2125-2130, 2131-2136, 2137-2142, 2143-2148, 2149-2154, 2155-2160, 2161-2166, 2167-2172, 2173-2178, 2179-2184, 2185-2190, 2191-2196, 2197-2202, 2203-2208, 2209-2214, 2215-2220, 2221-2226, 2227-2232, 2233-2238, 2239-2244, 2245-2250, 2251-2256, 2257-2262, 2263-2268, 2269-2274, 2275-2280, 2281-2286, 2287-2292, 2293-2298, 2299-2304, 2305-2310, 2311-2316, 2317-2322, 2323-2328, 2329-2334, 2335-2340, 2341-2346, 2347-2352, 2353-2358, 2359-2364, 2365-2370, 2371-2376, 2377-2382, 2383-2388, 2389-2394, 2395-2400, 2401-2406, 2407-2412, 2413-2418, 2419-2424, 2425-2430, 2431-2436, 2437-2442, 2443-2448, 2449-2454, 2455-2460, 2461-2466, 2467-2472, 2473-2478, 2479-2484, 2485-2490, 2491-2496, 2497-2502, 2503-2508, 2509-2514, 2515-2520, 2521-2526, 2527-2532, 2533-2538, 2539-2544, 2545-2550, 2551-2556, 2557-2562, 2563-2568, 2569-2574, 2575-2580, 2581-2586, 2587-2592, 2593-2598, 2599-2604, 2605-2610, 2611-2616, 2617-2622, 2623-2628, 2629-2634, 2635-2640, 2641-2646, 2647-2652, 2653-2658, 2659-2664, 2665-2670, 2671-2676, 2677-2682, 2683-2688, 2689-2694, 2695-2700, 2701-2706, 2707-2712, 2713-2718, 2719-2724, 2725-2730, 2731-2736, 2737-2742, 2743-2748, 2749-2754, 2755-2760, 2761-2766, 2767-2772, 2773-2778, 2779-2784, 2785-2790, 2791-2796, 2797-2802, 2803-2808, 2809-2814, 2815-2820, 2821-2826, 2827-2832, 2833-2838, 2839-2844, 2845-2850, 2851-2856, 2857-2862, 2863-2868, 2869-2874, 2875-2880, 2881-2886, 2887-2892, 2893-2898, 2899-2904, 2905-2910, 2911-2916, 2917-2922, 2923-2928, 2929-2934, 2935-2940, 2941-2946, 2947-2952, 2953-2958, 2959-2964, 2965-2970, 2971-2976, 2977-2982, 2983-2988, 2989-2994, 2995-3000, 3001-3006, 3007-3012, 3013-3018, 3019-3024, 3025-3030, 3031-3036, 3037-3042, 3043-3048, 3049-3054, 3055-3060, 3061-3066, 3067-3072, 3073-3078, 3079-3084, 3085-3090, 3091-3096, 3097-3102, 3103-3108, 3109-3114, 3115-3120, 3121-3126, 3127-3132, 3133-3138, 3139-3144, 3145-3150, 3151-3156, 3157-3162, 3163-3168, 3169-3174, 3175-3180, 3181-3186, 3187-3192, 3193-3198, 3199-3204, 3205-3210, 3211-3216, 3217-3222, 3223-3228, 3229-3234, 3235-3240, 3241-3246, 3247-3252, 3253-3258, 3259-3264, 3265-3270, 3271-3276, 3277-3282, 3283-3288, 3289-3294, 3295-3300, 3301-3306, 3307-3312, 3313-3318, 3319-3324, 3325-3330, 3331-3336, 3337-3342, 3343-3348, 3349-3354, 3355-3360, 3361-3366, 3367-3372, 3373-3378, 3379-3384, 3385-3390, 3391-3396, 3397-3402, 3403-3408, 3409-3414, 3415-3420, 3421-3426, 3427-3432, 3433-3438, 3439-3444, 3445-3450, 3451-3456, 3457-3462, 3463-3468, 3469-3474, 3475-3480, 3481-3486, 3487-3492, 3493-3498, 3499-3504, 3505-3510, 3511-3516, 3517-3522, 3523-3528, 3529-3534, 3535-3540, 3541-3546, 3547-3552, 3553-3558, 3559-3564, 3565-3570, 3571-3576, 3577-3582, 3583-3588, 3589-3594, 3595-3600, 3601-3606, 3607-3612, 3613-3618, 3619-3624, 3625-3630, 3631-3636, 3637-3642, 3643-3648, 3649-3654, 3655-3660, 3661-3666, 3667-3672, 3673-3678, 3679-3684, 3685-3690, 3691-3696, 3697-3702, 3703-3708, 3709-3714, 3715-3720, 3721-3726, 3727-3732, 3733-3738, 3739-3744, 3745-3750, 3751-3756, 3757-3762, 3763-3768, 3769-3774, 3775-3780, 3781-3786, 3787-3792, 3793-3798, 3799-3804, 3805-3810, 3811-3816, 3817-3822, 3823-3828, 3829-3834, 3835-3840, 3841-3846, 3847-3852, 3853-3858, 3859-3864, 3865-3870, 3871-3876, 3877-3882, 3883-3888, 3889-3894, 3895-3900, 3901-3906, 3907-3912, 3913-3918, 3919-3924, 3925-3930, 3931-3936, 3937-3942, 3943-3948, 3949-3954, 3955-3960, 3961-3966, 3967-3972, 3973-3978, 3979-3984, 3985-3990, 3991-3996, 3997-4002, 4003-4008, 4009-4014, 4015-4020, 4021-4026, 4027-4032, 4033-4038, 4039-4044, 4045-4050, 4051-4056, 4057-4062, 4063-4068, 4069-4074, 4075-40

approved by his snobbish stepbrothers. The greatest time of the colonel's life had certainly begun with his return to England, and his meeting and reunion with his dear boy. From the day Clive had been taken away from him in India, he had lived in dreams and plans of what he would do when he came home to spend his furlough with his son.

#### COLONEL NEWCOME PLANS A "GRAND TOUR" FOR HIS SON CLIVE

These were the days when every young gentleman's education was supposed to be complete only when he made "the grand tour" through Europe. So, out there in India, the colonel had read up all sorts of books of travel, and had spent many an hour studying maps, planning out the tour he would take his Clive some day. And, of course, he saved his money, so that Clive should want for nothing, yet he never let his personal economies interfere with his generosity to others. Though his own clothes grew shabby, there was not a man who knew him but respected his well-worn uniform, knowing full well that his nature was free from the tiniest taint of meanness.

Clive's natural gifts seemed to lie in the direction of draughtsmanship. At the Greyfriars School he was continually making comic sketches of the masters and the scholars, and these he sent out to his admiring father in India, who showed them all round the regiment with the most innocent pride.

"The boy's talent for drawing is wonderful, sir, wonderful!" he would say to his brother-officers. "He sent me a picture of our old school, the very actual thing, sir—the cloisters, the school, the head gown-boy going in with the rods, and the doctor himself. It would make you die of laughing!"

The colonel would also regale the ladies of the regiment by reading Clive's

letters aloud to them, as well as letters from a lady friend in praise of the wonderful boy. He even bored some of his hearers with this prattle; and sporting young men would make bets that the colonel would mention Clive's name once before five minutes, three times in ten minutes, twenty-five times in the course of dinner, and so on. But they who laughed at the colonel laughed very kindly; and everybody who knew him loved him—everybody, that is, who loved modesty and generosity, and honour.

#### THE MEETING OF FATHER AND SON AND THE HAPPINESS OF BOTH

At last, the happy time had come for which the kind father had been longing more passionately than any prisoner for liberty, or schoolboy for holiday. Once more he was treading the muddy pavement of Smithfield on his way to Greyfriars, a path he had trodden many a time in his own early days. As he arrived at the school it was the play-hour, and all was noise and bustle. But

Clive, dressed in his very best, saw his father at once and hastened to him. Schoolboys, grinning through the bars, envied him as he walked away; senior boys made remarks on Colonel Newcome's loose clothes and long whiskers, his brown hands and unbrushed hat. But the gigantic Smith, the cock of the school, who happened to be looking majestically out of a window, was pleased to say that he thought Newcome's governor was a fine, manly-looking fellow.

The colonel himself used almost the same words about his own son when he sat down that night to smoke a cigar with his old friend, James Binnie, the quiet but able Scotsman, who had come back with him after twenty years of service as a magistrate in India. "Isn't he a fine fellow, James?" said the colonel, his face alight with joy.

#### THE COLONEL READING CLIVE'S LETTERS



Colonel Newcome used to bore his friends in India by reading aloud Clive's letters, and always talking about his boy. But they all liked him none the less.





and manly frankness, caused some disturbance in the family circles of his snobbish stepbrothers. His arrival in their midst was like a breath of fresh air driving through a hot and stuffy room. His disregard for all their shoddy nobility, his failure to be impressed either by wealth or title, displeased the elder Newcomes sadly: but the fresh air of his character had an unexpected effect on one of the family.

#### HOW THE OLD COLONEL WON THE HEART OF HIS LITTLE NIECE, ETHEL

Although Ethel's training had been of a kind to make her haughty and contemptuous to those whom she had been taught to consider beneath her in worldly position, her better nature had prevented her from being entirely spoiled. When she met her uncle, the colonel, for the first time, his breezy nature quite won her girlish heart, and he was equally delighted with his lovely little niece. He took her little slim hand, and laid it on his brown palm, where it looked all the whiter; he cleared the grizzled moustache from his mouth, and stooping down he kissed the little white hand with a great deal of grace and dignity. There was no point of resemblance, and yet there was something in the girl's look, voice, and movements which caused his heart to thrill, and an image out of the past to rise up and salute him. The eyes which had brightened his youth, and which he saw in his dreams and thoughts for many years afterwards, as though they looked at him out of heaven, seemed to shine upon him after five-and-thirty years. He remembered such a fair bending neck and clustering hair, such a light foot and airy figure, such a slim hand lying in his own, and now parted from it with a gap of ten thousand long days between.

#### THE COLONEL HAS A NEW PLAN FOR THE HAPPINESS OF CLIVE

In short, the good colonel was so charmed with Ethel that his thoughts at once flew in the very direction Sir Brian would have dreaded—he was presently dreaming of the happiness that might be his, if he but saw his dear boy Clive wedded to this charming little lady. Thoughts of his boy were uppermost in his mind that night when he said to his servant, "I say, Kean, is that blue coat of mine very old?"

"Uncommon white about the seams, colonel," said the man.

"Is it older than other people's coats?"

Kean was obliged gravely to confess that the colonel's coat was very queer.

"Get me another coat, then. See that I don't do anything or wear anything unusual. I have been so long out of Europe that I don't know the customs here, and am not above learning."

And Kean retired for the night, vowing that his master was an old tramp, as indeed he was. For his new concern about his clothes sprang from his desire to be a credit to Clive, by appearing smart and well dressed among his friends.

Whatever the plans of the worthy colonel may have been to further the idea of a marriage between his son and Ethel, Clive himself now took a step which would probably have upset his father's best-laid plans, though the colonel loved him too well ever to find fault with what he had done. Clive decided to become an artist.

#### CLIVE NEWCOME DECIDES TO BECOME AN ARTIST AND BEGINS HIS STUDIES

Now, to earn one's living by drawing pictures or by writing books used to be considered a very doubtful occupation, and not befitting a gentleman. Certainly, there was no hope that the purse-proud parents of Ethel, far less old Lady Kew, would dream for one moment of having an artist marry the heiress.

But, whatever Colonel Newcome may have thought about his son's choice of profession, he did all he could to advance Clive's artistic education. In addition to arranging for him to become a student under a well-known master of the time, named Gandish—whose knowledge of art had been acquired at the expense of other education, as he was in the habit of describing painting as "tigh hart"—the colonel had a studio fitted up for Clive at the house which he and James Binnie had rented during their proposed sojourn in London.

Of course, Clive was speedily a favourite in the somewhat mixed society that centred around Gandish's, and all sorts of brilliant things were prophesied of his future. The fact that he was daily to be seen riding a fine horse among the fashionable people of the West End may also have had



Hereceived so much interest out of this concern that he now esteemed himself quite a rich man, and the first thing he did in England was to go to Sir Barnes Newcome, his nephew, who, at the death of his father, Sir Brian, had become head of the Newcome Bank. Sir Barnes was just the same mean-spirited man that his father had been, but he listened to what the colonel had to say, out of respect for the Bundlecund Banking Company. And what the colonel had to say was soon told.

#### ONE MORE DISAPPOINTMENT FOR COLONEL NEWCOME AND CLIVE

"I have a pension of a thousand pounds a year," he said, "besides all the money I have made out of the banking company, and two hundred a year is all that I want for myself. I will give Clive every shilling of the rest to-morrow, if he marries as I wish him to. My boy will thus have an income of three or four thousand pounds a year, Barnes," cried the colonel, with his face shining. "I want your sister—I want my dear Ethel for him!"

But all the colonel had to offer seemed a poor substitute to Barnes for Lord Farintosh's fifteen thousand a year, though he pretended, for the sake of business relations with the Bundlecund Company, to look with favour on the colonel's proposal. Soon afterwards, however, when Lady Kew had hurried Ethel off to Scotland, where her engagement to Farintosh was publicly announced, the colonel found he had been deceived, and, hastening at once to the Newcome Bank, he gave Sir Barnes a bit of his mind in the presence of his clerks, denouncing him as a liar and a traitor.

The cowardly Barnes was urged by his friends to challenge the colonel to a duel, but excused himself from fighting with his uncle, and, when Clive challenged him, he showed the white feather again.

#### A NOTHER TOUR ABROAD AND WHAT HAPPENED BEFORE IT ENDED

Once more in their unequal fight against their scheming relatives, whose sole wish was not at all for Ethel's happiness, but to see her married to a wealthy nobleman, the colonel and his son sought to console themselves by a long tour on the continent. Towards the end of the tour they found themselves in the city of Brussels in the late

autumn, and there settled down for the winter with the colonel's old friend, James Binnie, who was living abroad with his widowed sister, Mrs. Mackenzie, and her beautiful young daughter, Rosa.

While their tour abroad had in some sense brought them calm of mind and resignation of heart, it was also to prove a crowning misfortune. For a letter, which would have brought them back to England as fast as post-chaise and vessel could carry them, had followed them from place to place until it was lost to them for ever. This letter told how, disgusted at last by the fortune-hunting and title-seeking schemes of Lady Kew and Sir Barnes, in which no thought was given for her real feeling, Ethel had revolted and refused absolutely to be married to Lord Farintosh. Not only so, but Lady Kew herself had died suddenly, and Ethel was now the heiress of her fortune, and free to marry as her heart would guide her.

Alas for Clive, when at the end of the winter he returned to London with his father—he was no longer free! He was accompanied by his young wife, Rosa, the daughter of Mrs. Mackenzie.

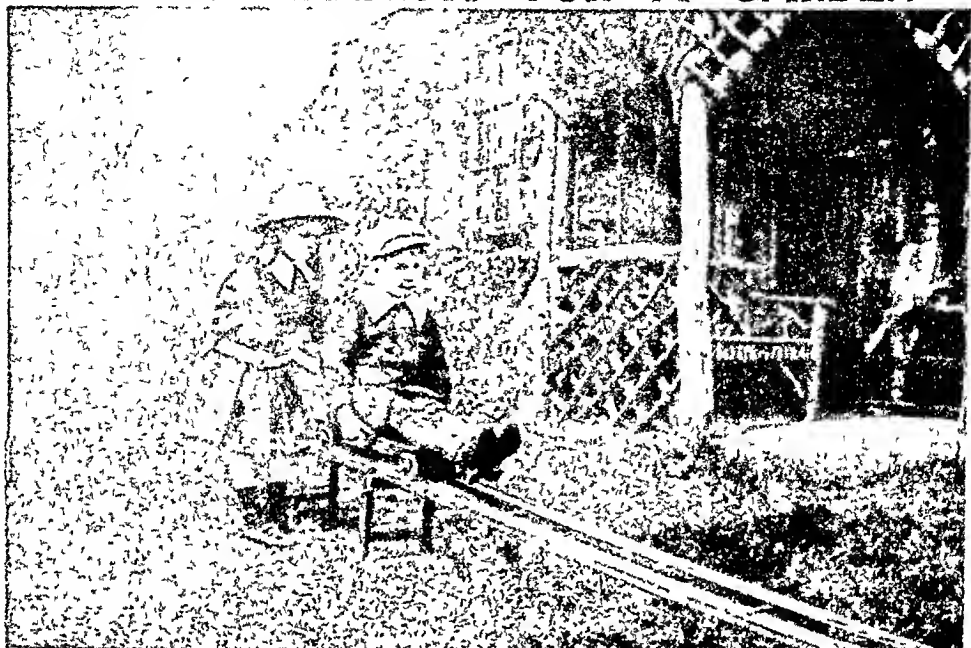
#### COLONEL NEWCOME'S NEW LIFE IN LONDON AS A MAN OF WEALTH

A great change now took place in the life of the colonel. The Bundlecund Banking Company was supposed to be flourishing immensely, and Colonel Newcome, as one of its leading directors, was expected to maintain a great style in London, to impress the world with the importance of his company. He, who had been content with the humblest of houses and the plainest fare, now opened a magnificent mansion in the West End, where Clive and Rosa lived with him in splendour, and all the fashionable world came to admire the state of the rich Indian bank director.

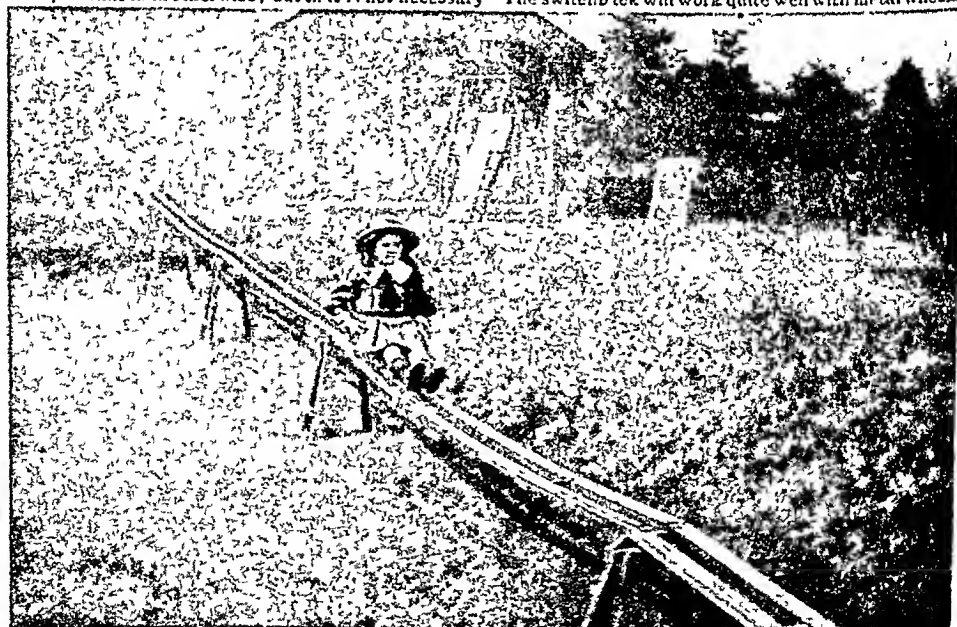
But, all too soon, he found that, amid this display of wealth and its luxuries, unhappiness crept in. Clive could not be resigned to the loss of his first love by his hasty marriage, for Rosa did not fill the place that Ethel might have occupied. The colonel had strange forebodings of disaster which nothing seemed to clear away, not even the great day when he was elected member of Parliament for Newcome against his unworthy nephew, Sir Barnes, who had opposed him. The disaster came



# A TOY RAILWAY FOR A GARDEN



These two pictures show a simple garden switchback, which, if properly constructed and properly used, is quite safe, and affords plenty of exciting and healthy amusement. But it must be properly and strongly made, and it would be risky to make it yourself unless you are an expert carpenter. A carpenter, or an engineer, is the proper person to do the work, and any carpenter, after being shown these pictures, would know how to do it. The supports must be strong, the planks and the rails must be securely fastened together, and both sides should be on the same level. If the wheels of the carriage have rubber tyres, the working will be almost noiseless and much more pleasant than otherwise, but that is not necessary. The switchback will work quite well with metal wheels.



In the first picture the little girl is starting the boy, and in this picture the little girl is riding down the switchback. If the lawn or garden is on a slope, the starting-point should be at the top of the slope, and the finishing-point at the bottom. But the effect of a slope can be got on level ground by having the trestles or supports of different heights, the highest being at the starting-end. Even if the switchback is level, it can be made to work by the passenger inclining the body as if on a swing. The weight thus thrown forward sends the carriage along.

# THINGS TO MAKE AND THINGS TO DO



## FUN IN A BOX OF MATCHES

A box of Swedish safety matches costs about half a farthing. A good deal of amusement can be got out of this half farthing's worth and still leave the matches perfect for their original purpose. The pictures that we see in this article can teach us some tricks with matches.

The first feat that we may try to perform is to join three matches with one match. It sounds hard but the pictures show that it is really simple. We first split the end of one match a little way and trim the end of the second to a wedge-shaped point. We insert the wedge-shaped point into the split, when the two will be the shape of an inverted V as seen in picture 1. Now we place a third match as seen in picture 2 so that the whole three remain steady, like the corners of a hollow pyramid. By inserting a fourth match as seen in picture 3, and then by getting rid of the two outer matches so that the third match still remains standing, we have the whole done. It is a pretty feat.



1 Joining two match ends



2 Three matches standing



3 Putting them steady with one match



4 One match standing



5 The result

The flame should be put out by blowing straight down upon the matches. Then by using the fourth match in the manner shown in picture 5, it may be lifted. The burning of the three matches, heads to the point, has caused the head of the fourth match to rise up and the three to fall down. The fact that the three matches are so lighted and the flame is made to touch the head of the other matches when they will take fire.

Now we may see another trick. A box of ten several matches with one match in the middle of the box. We place a match as seen in picture 1, and then by means of the match in the middle of the box, we can make the match in the middle of the box stand up. This is a pretty feat.

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# THINGS TO MAKE AND THINGS TO DO

problem is to take away eight matches and leave two squares. This is shown in picture 9.

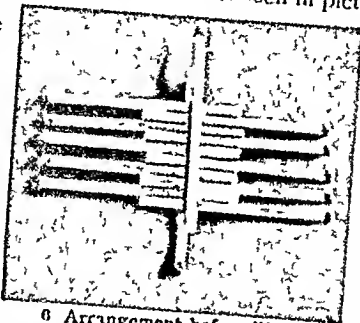
The next thing that we shall do is neither a puzzle nor a feat, but it is interesting. We take a matchbox and three matches, which we arrange like picture 10, with a matchstick head outwards into each side of the box and another match held between the two heads. The "spring" given to the two matches by pulling them apart so as to admit the third, will hold the third one securely. Then we tell our friends that we propose to apply a light to the middle of the third match, and invite them to say which of the other two will first take fire from the flame. In every case the opinion will be the match next to the head of the cross match. But this is found not to be so. The third match as it burns in the middle gets weaker, and soon the pressure

of the other two matches upon its ends bends it and then makes it jump into the air quite a little way. Now, there is a genuine trick that is a little mystifying if adroitly performed. We take a match in each hand, the hands resting palms upwards on the table. Then we close the hands and ask someone to place a match upon the closed fists, as seen in picture 11. We now say that we are able to pass the match from one hand into the other without opening the hands. We make a rapid up-and-down movement of both hands. This causes the two visible matches to fall on the table, and we ask our friend to replace them on top of the knuckles. He does so, and we make another rapid movement so as to cause the two exposed matches to fall into the hands. Then we open the hands, one of which is found to contain three

matches and the other to contain only one, as seen in picture 12. The secret of the trick is that when we let the two matches fall upon the table, they were not the two from the top of the knuckles of each hand, but one from the knuckles and one from the palm of the same hand. The movement we made caused one knuckle match to fall into the palm of the hand, so that, unseen by the spectators, when the two matches were seemingly replaced, one palm held two matches and the other was quite empty.

The next trick to which we shall give attention is called the tramps and ducks. We take seven matches, two of which we retain—one being left in each hand—and the other five we place on the table in front of us, as seen in picture 13. Then we tell the little tale of the tramps and the ducks. "There were two tramps—the matches in the hands—who saw five ducks—the matches on the table—and resolved to steal them. So they took one alternately." Here we pick up the first of the five matches with one hand, the second with the other hand, and

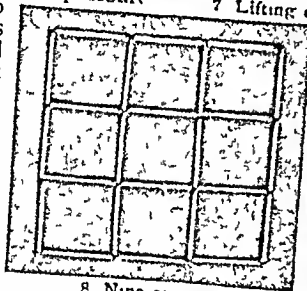
so on, alternately, until there are none left on the table. We resume the tale. "But before they had run away they saw the farmer coming, and so they put down the ducks again." Here we replace the matches on the table, one from each hand, alternately, until all five have been put down. "The tramps hid in a hedge until the farmer had gone, and then they took them up as before." Suiting the action to the words, we again pick up the matches one after another with alternate hands. Then, keeping the hands closed, we go on again. But the tramps began to quarrel, and one



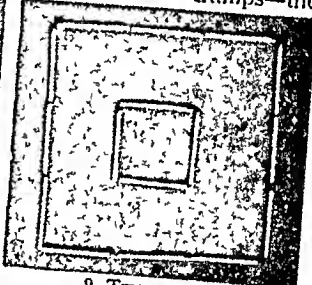
6 Arrangement before lifting



7 Lifting eleven matches



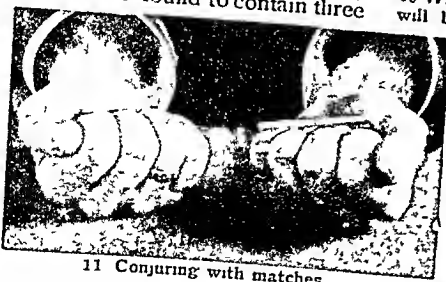
8 Nine squares



9 Two squares



10 Which match will burn first?



11 Conjuring with matches



12 How is it done?





# SOME GAMES FOR OUT OF DOORS

## GARDEN QUOITS

GARDEN quoits should be played with wooden rings, or wire ones bound with some soft material. A peg is driven into the ground, and the players stand at a distance, each having a number of rings. They then throw in turn and those who get the greatest number of rings over the peg win the game, and any prizes that may have been offered

## CUDGEL

Two small holes, ten feet apart, are scooped in the ground, and round each a circle about a foot wide is drawn. At these holes two batsmen stand, each armed with a short stick, one end of which is held in the hole. From a short distance away, two bowlers pitch, in turn, a small piece of wood, called a cat, towards the holes. It drops into one of the holes both batsmen are out, but if it is struck by one of them they change places as quickly as possible while the bowlers try to drop the cat in a hole before either of the batsmen can protect it by popping in his stick. If the cat is pitched by a bowler so as to fall inside the circle surrounding a hole, he picks it up and runs to a little distance with his partner.

They then decide between themselves, without the batsmen knowing, which shall hold the cat, and then return to ask the batsmen to guess who holds the cat. As the question is asked they both kneel down, one opposite each hole, and the batsmen answer by simply standing together opposite the bowler they choose. If the guess is correct the game must go on as before, if wrong, the boy holding the cat at once pops it into the hole by which he is kneeling, and the batsmen become bowlers.

## HOP, SKIP, AND A JUMP

SCRATCH a line on the ground, and stand so that the toes just touch it. Then, hitting one foot, hop as far as possible. Follow this with a skip, and then, with both feet together, give a long jump, remaining quite still at the end of it till someone has drawn a line where the heels struck the ground. Each player in turn does his best, and the one who covers the greatest distance with his hop, skip, and a jump is the winner.

## OBSTACLE RACE

THIS is great fun and will show the different ways boys have of getting over difficulties. Instead of the race-course being kept quite open, obstacles are put up at different places for the runners to get over as best they can. Those who do so most quickly are likely to reach the winning-post first. For small boys these obstacles should not be too troublesome. The first might be a long hurdle for them to climb, the next, a row of bottomless canvas sacks side by side on the grass, one for each boy to crawl through, and perhaps beyond these a number of ordinary school slates pegged to the ground with pencils attached, upon

which each runner must write—quite distinctly—a short sentence arranged beforehand, adding his number instead of his name at the bottom of the slate. Other kinds of obstacles, however, will very soon suggest themselves to those who manage the race.

## GUARD THE BLOCK

IN the middle of a large circle an old tin or small block of wood is placed, and the "keeper" stands over it to guard it. The rest of the players try to kick it out of the circle, and when one succeeds they all run away and hide. The keeper then replaces the block, and sets off in search, but he dare not go far in case one of the enemy should run from hiding and steal his block again. The moment he spies anyone, he calls out his name and races back to the block to touch it before the boy he has found can get there. If he succeeds in doing this the other becomes his helper, and the first keeper may more safely go on with his search, but he should not go too far, lest several of theinders come out and attack his new partner. In that case he would have to begin all over again. Every time anyone is found the keeper must touch the block, and when more than half the players have in this way become assistant keepers, the rest must return from hiding, and a new keeper is then chosen.

## THE LEAPING-POLE

THE leaping-pole should be of strong wood, quite smooth, and not too heavy. The boy who uses it should not hold it too high up to begin with, and should not try to jump too far. He ought to make a short run, and, taking a firm grip with both hands, putting the right a little above the head and the left about two feet lower down, plant the foot of the pole on the ground, and lift himself up as it swings over. The height and length of the jumps should be increased by degrees. There is no healthier exercise than that with the leaping-pole, if it is used as it should be.

## THE JOLLY MILLER

THE miller stands in the centre of a circle formed by the rest of the players walking round and round in couples, arm in arm. They sing this song as they walk:

"There was a jolly miller and he lived by himself,  
As the wheel went round he made his pelf  
One hand on the hopper, and one on the bag,  
As the wheel went round he made his grab."

At the last word the couples change partners. Each outside player moves forward and takes the place of the inside player in front, who, at the same time, occupies the place left vacant by his partner. If the miller, however, can get a place first, the player who is left without a partner must take the place in the centre of the walking ring or wheel, and wait for the chance of "grabbing" someone else's place when the verse has been sung again.

## PREPARING A PICNIC LUNCH-BASKET

WHEN we go for a picnic it is best to take things which weigh as little as possible if we have to carry everything ourselves, for we do not want a heavy load to tire us before we reach the spot decided on for lunch. So we choose a light wicker basket and replace china plates by paper ones. Then serviettes by crinkled paper, the tablecloth by sheets of thin carded paper such as is used for lining a chest of drawers, a salt-cellar by a screw of paper and so on, taking as few knives and forks as we can possibly do with.

One or two teaspoons passed round to stir tea or coffee before drinking, it will be found enough. Half the fun of a picnic is the carrying it involves in the absence of table accessories. Little paper mache cups will do quite well in place of ordinary cups and plates.

As for the eatables it is well to take things that will not spoil, crusty or moist when packed up, so much as will keep, overripe fruit and if it be the strawberry or raspberry season take only the dry ones. They carry best between all large leaves on the top of the basket or in a packet covered with leaves. Bananas, plums, green grapes, peaches, apricots, apples, and oranges are so easy to carry. Our lunch may be a very simple one, but enough to satisfy the hearty appetites of boys and girls, or something more elaborate to entertain friends. Suppose we think of not a simple lunch first.

We shall find that hard eggs and bread and butter are easy to carry and easy to carry. The eggs are boiled for five minutes and then placed in cold water for two or three minutes to harden them a little more. We wrap each one by itself in paper and place them in a small box or tin. The bread is cut into slices and packed in a paper bag or tin. The butter is wrapped in paper and packed in a small box or tin. The eggs are boiled for five minutes and then placed in cold water for two or three minutes to harden them a little more. We wrap each one by itself in paper and place them in a small box or tin. The bread is cut into slices and packed in a paper bag or tin. The butter is wrapped in paper and packed in a small box or tin.

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Pressing the pile of sandwiches down with the left hand, we take a large sharp carving knife and cut off the crusts from the four sides of the pile. The sandwiches are then done up in packets of oiled paper covered with thick white paper.

Another favourite item of a simple picnic lunch is chocolate and white bread. Indeed a fancy roll and a thin tablet of milk chocolate followed by one or two bananas and a few raisins make a most satisfying meal.

If we have Cornish boys in the picnic party they are sure to like a paste and home-made sausage rolls generally meet with approval. They are easy to pack in paper or a card box.

A few little fairy cakes or buns and fruit in wicker boxes will be put on the top of our basket, and we shall hardly need



A family picnic in the wood.

knives and forks. A few fruit tins will also be wanted for the fruit. The picnic is a most enjoyable one, and we shall hardly need to be particular as to the food. We can get a good deal of drinking water or milk. Fruit is not so certain as the food, but it is not a bad plan for the picnic party to join the picnic club.

To be careful and provident in the picnic, it is best to share the expense and divide it into two parts. One may be for the picnic itself, and the other for the picnic. It is not a bad plan for the picnic party to join the picnic club.

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# OUR LITTLE VEGETABLE GARDEN

## WHAT TO DO AT THE END OF JUNE

WE may still continue the routine work, pinching out side growths from the tomatoes, and planting out the young "greens," thinning the carrots and beet, the lettuces and radishes, and getting the late celery into the trenches. Very soon we should begin to enjoy our earliest crops of lettuces, radishes, peas, and so on. The drier the weather, the more frequently should the hoe be used to keep the surface stirred and loose, and also, of course, to keep down weeds, and frequent watering may be necessary for the freshly transplanted young vegetables.

It is always a good thing, if we can manage it, to keep a small portion of our little plots as a nursery garden, where we may put in cuttings that we want to strike. Small seedlings may be planted here until we have space to remove them to their flowering quarters, and here, when the time comes, we may put in the runners of strawberries to root.

Some people who have not sufficient room to grow strawberries in their gardens make use of a novel method very successfully—they grow them in barrels, and in this way grow quite a number of plants on the smallest amount of ground space possible. The description as to how strawberries may be cultivated in this way may induce some of us to try the method. This is how it is done. A large barrel is obtained, and holes are made all round it about three inches in diameter, with a foot or fifteen inches from hole to hole. This means, of course, that there will be several tiers of holes, and each hole is to contain a strawberry plant. If paraffin barrels are used, all traces of the oil must first be removed; then they are filled with soil, which must be made quite firm and be given ample time to settle, more soil may be added later. Some people, in filling the barrels with soil, place a pole in the middle of the barrel and build up the soil round it, when quite filled they remove this, and thereby have a space which will hold water.

After the watering, it is as well to replace the pole—that is, of course, when the water is absorbed. The barrel should be filled some time before planting, so that the soil may become thoroughly firm, but in the meantime it should be watered, for if the bulk of the soil becomes dust-dry, it is very difficult to get it thoroughly moist again.

## ANSWERS TO THE PICTURE-PUZZLE ON PAGE 3510

ON page 3510 we have a drawing of a large steamer beside a quay, and in it the artist made several mistakes. Here is a list of them—

1. There is no name on the bow.
2. The portholes open outward instead of inward, as they should open.
3. The scupper is opened the wrong way.
4. The railings are unfinished.
5. The numbers should read upward.

We are thinking about this now, because early in July we may root our strawberry runners in readiness for the autumn, when we may establish them in the tub, but there is, of course, no hurry to fill the tub with soil for some while yet—it is the plants which must at present occupy our attention. But even now we may draw up a little soil around these runners while still on the plants. As a general rule, it is not a good thing to let the runners form, they should be cut off as they appear, in the same way as violet runners, but if we want to form plants, as many runners as we require plants must be allowed to remain. If the soil is drawn up round them, probably when the runners are removed they will be found to have already formed roots.

It may sometimes be necessary, even at the height of summer, to do a little planting in our flower garden; something may have failed or died, and we have an empty space to fill. Now, such planting requires considerable care, especially in hot, dry weather. If the plants we are to deal with are already growing in pots, there is not so much difficulty. We should water in the morning, and not attempt to plant them out until the evening. Having planted them, we should again water them, both at the root and, with the rose on the can, overhead. Shade for a few days is very desirable, and we may put some sticks into the ground around the plant, and then arrange a bit of light sacking, or anything we can find, round the outside of the sticks, and another piece lightly over the top. These can be removed during the night and replaced for the day for a short while, say, three or four days, unless it is cloudy and showery, when this shading will scarcely be necessary. But it is well worth while taking trouble to prevent a plant from receiving a severe check, and with this due care as to shading and watering during the first few days after moving, we need not hesitate to transplant a subject even in full flower if it be necessary.

We must look after our young seedling plants of wallflower and sweet-williams, and other things that we have been growing for next year's flowering. They should be pricked out in our nursery bed as soon as they can be conveniently handled, and they must be kept clear of weeds and watered when necessary. We shall plant them out where they are to flower in the autumn.

6. The foremast is leaning forward instead of backward.

7. The funnels also should lean back.

8. The waste steam pipes should be in front of the funnels.

9. The anchor-chain hole is the wrong way.

10. No ship in dock has an anchor down.


11. There are no ventilators, balliards, fore-top or stay, or side-light board.

The Child's Book of  
SCHOOL LESSONS



### READING

## THE MEANING OF COMMON ABBREVIATIONS

In our reading we often see contractions or initial letters which we know stand for something. We may not know what they stand for
 
 and, consequently, miss their meaning. On this and the following pages are given the contractions that we come across most frequently in our reading.

As The principal use of this  
is seen on it for ships. At  
Lloyd's ship that is classed  
as A is a ship that is almost  
new or of a good new  
The A refers to the quality  
of the hull, and the 1 to the  
anchors, cables, and wires.  
The expression has now  
come to be used for any-  
thing that is very good. If  
we say that we feel as we  
mean that we feel in the  
very best of health.

A. 11. Blue head of seam is  
a bit of what is no longer  
an appetitive and is not  
as clear such as a capate  
male or less away

A.D. In the Year of Our Lord  
Taken from the Latin words  
Anno Domini. Our system  
of numbering the years is  
the Anno Domini system.  
A.D. 1492 means the  
year 1492 after the  
year of Christ's birth.

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 7. A man was  
 8. A man was  
 9. A man was  
 10. A man was

\* In the April 1961 issue  
 of the Journal of the  
 American Chemical Society  
 a note by J. H. Goldstein  
 and J. S. Burdett was published

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year 1297 A.D. they mean  
the same year as we do  
when we speak of 1296 A.D.

Ala. Ala. and one of the  
1. Ala. of L. S. A.

AM Police from The  
let us represent the Latin  
wooden sculpture

LM In the year of the world. The letters represent the Latin words around. The first is on the year from the first of the world was said to have been created, which was 5500 B.C. The last year was A.D. 1900. The first year began on September 1st and the last year began on September 1st.

6-23-68 10:00 AM

1954

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a copy of the original letter, and is signed by Abraham Lincoln.

1. The first group of people who are not allowed to enter the country are those who are not citizens of the United States.

27-1-1941

10-11-68

1954-1955

A.R.S.A. Associate of 1 in  
Royal Society in America  
or Associate of the Royal  
Society of Arts

ARS L. Associate of the  
Royal Society of London

AR 54 to within Royal  
Army of Africa

The letters found in the  
Laurelwood of Hyattsville  
Avenue North 1912-1913

A. V. Ash noted receipt of the D. C.

P. A. Lee & Co. Ltd. The  
Inventors of the Lamp

D.C. Police Unit. The

1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2

that the year 1965 was the  
year before the birth of  
the new nation.

One of the joys of  
AC is a free lunch  
the first of June.

The City of Chicago  
 Public Works Department  
 Bureau of Engineering

11. The above is correct  
 12. The above is also  
 13. The above is

The first of these is the

1. 2019. 10. 10. 10:00 ~ 10:30  
 2. 2019. 10. 10. 10:30 ~ 11:00  
 3. 2019. 10. 10. 11:00 ~ 11:30

1. The first part of the document is a list of names and their corresponding dates. The names are: "John Doe", "Jane Smith", "Bob Johnson", "Alice Brown", "Charlie White", "David Green", "Eve Black", "Frank Gray", "Grace Pink", "Henry Blue", "Ivy Yellow", "Jack Purple", "Karen Red", "Leo Orange", "Mia Silver", "Noah Gold", "Olivia Bronze", "Pete Copper", "Quinn Iron", "Rory Tin", "Sam Lead", "Tina Zinc", "Uma Nickel", "Victor Platinum", "Wendy Silver", "Xavier Gold", "Yara Bronze", "Zoe Copper". The dates are: "1990", "1991", "1992", "1993", "1994", "1995", "1996", "1997", "1998", "1999", "2000", "2001", "2002", "2003", "2004", "2005", "2006", "2007", "2008", "2009", "2010", "2011", "2012", "2013", "2014", "2015", "2016", "2017", "2018", "2019", "2020", "2021", "2022", "2023", "2024", "2025", "2026", "2027", "2028", "2029", "2030", "2031", "2032", "2033", "2034", "2035", "2036", "2037", "2038", "2039", "2040", "2041", "2042", "2043", "2044", "2045", "2046", "2047", "2048", "2049", "2050", "2051", "2052", "2053", "2054", "2055", "2056", "2057", "2058", "2059", "2060", "2061", "2062", "2063", "2064", "2065", "2066", "2067", "2068", "2069", "2070", "2071", "2072", "2073", "2074", "2075", "2076", "2077", "2078", "2079", "2080", "2081", "2082", "2083", "2084", "2085", "2086", "2087", "2088", "2089", "2090", "2091", "2092", "2093", "2094", "2095", "2096", "2097", "2098", "2099", "2100", "2101", "2102", "2103", "2104", "2105", "2106", "2107", "2108", "2109", "2110", "2111", "2112", 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1. The first step is to identify the problem or question that needs to be answered.

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# THE CHILD'S BOOK OF SCHOOL LESSONS

- C Centigrade The markings on the French or decimal thermometer. It is so called from the Latin *centum*, a hundred, and *gradus*, a step, because from freezing to boiling point is divided into 100 degrees. The British system of thermometer marking is the Fahrenheit, which is usually written F or Fahr. It is so called after Fahrenheit, the scientist who invented it.
- C Centime A French coin, five of which are about equal to our halfpenny.
- CA Chartered Accountant
- Cal California, one of the states of USA
- Cap Chapter, from the Latin *caput*, the head
- CB Companion of the Order of the Bath
- CB Confined to barracks
- CB Cape Breton, a part of Nova Scotia in Canada
- CC County Council, Cricket Club, or Cycling Club
- CDSO Companion of the Distinguished Service Order
- c.d.v. Carte-de-visite
- CE Civil Engineer, Christian Endeavour, or Children's Encyclopædia.
- Cf A contraction of "confer" and used in the sense of *compare*. In bookbinding cf means call
- CFI A commercial expression meaning cost, freight, and insurance
- CG Captain general, commissary-general, consul-general, coastguard, or captain of the guard
- Ch Chapter.
- CI Imperial Order of the Crown of India
- CIE Companion of the Order of the Indian Empire
- CM Master of Surgery. The letters stand for the Latin word *Chirurgia Magister*.
- Cm Centimetre, the French measure of length
- CMG Companion of the Order of St Michael and St George
- CO Commanding Officer
- Co. Co. or Co.
- c.o.d. Cash on delivery
- Col. Colorado one of the states of USA
- Comm. Commendatarius, one of the orders of USA
- COS Charity Organisation Society.
- CP Carriage paid.
- Cr. Credit or credit
- CS Chemical Society
- CS Civil Service
- CSI Companion of the Order of the Star of India
- CT Certified teacher.
- CTC Cyclists' Touring Club
- CVO Commander of the Royal Victorian Order
- CWO Cash with order.
- cwt Hundredweight, from c for *centum*, a hundred, and wt for weight
- d Penny or pence 2d means two pence, and 1d means one penny. The d is for the Latin word *denarius*
- DC Repeat from the beginning. A contraction used in music, and standing for the Italian words *Da capo*. Also district of Columbia, in which is Washington, the capital of USA
- DCL Doctor of Civil Law.
- DD Doctor of Divinity. The letters stand for the Latin words *Divinitatis Doctor*
- Del Delaware, one of the states of USA
- DG By the grace of God. The letters stand for the Latin words *Dei gratia*
- DL Deputy Lieutenant
- DLit Doctor of Literature
- DLO Dead Letter Office
- Dr Doctor or debtor
- dr Dram
- DSc Doctor of Science. The letters stand for the Latin words *Doctor Scientiarum*.
- DSO Distinguished Service Order
- DV The letters stand for the two Latin words *Deo Volente*, meaning God willing
- dwt Pennyweight d stands for the Latin word *denarius*, and wt is a contraction for weight
- E East.
- E & OE Errors and omissions excepted
- EC East Central, a London postal district
- ECU English Church Union
- eg For example. The letters stand for two Latin words, *exempli gratia*.
- ENE First-north-east—the point of the compass midway between the east and the north-east
- ER King Edward, standing for the Latin words *Edwardus Rex*.
- ERI Edward, King and Emperor, standing for the Latin words *Edwardus Rex Imperator*
- ESE East-south-east, the point of the compass midway between east and south-east
- etc Etcetera, meaning and others
- EU Evangelical Union
- F or Fahr The measurements of the Fahrenheit thermometer
- f. Farthing, florin, franc, foot, or fathom
- FAS Fellow of the Society of Arts or Fellow of the Antiquarian Society
- FBS Fellow of the Botanical Society
- FC Free Church or Football Club
- FCS Fellow of the Chemical Society.
- FD or Fid Def Defender of the Faith, from the Latin words *Fidei defensor*.
- F.G.S. Fellow of the Geological Society
- fl Florin
- Fla Florida, one of the states of USA
- FLS Fellow of the Linnean Society
- FM Field-marshal.
- fm Fathom
- fob Free on board. A commercial term
- FP Fire plug, frequently seen on walls, indicating that there is a fire plug near that spot
- fr France, the French coin
- FRAS Fellow of the Royal Astronomical Society or Fellow of the Royal Asiatic Society
- FRCP Fellow of the Royal College of Physicians.
- FRCS Fellow of the Royal College of Surgeons
- FRGS Fellow of the Royal Geographical Society
- FRHS Fellow of the Royal Horticultural Society.
- FRIBA Fellow of the Royal Institute of British Architects.
- FR Met. S. Fellow of the Royal Meteorological Society
- FRS Fellow of the Royal Society
- FRSL Fellow of the Royal Society of Literature.
- FSA Fellow of the Society of Arts or Fellow of the Society of Antiquaries
- FSS Fellow of the Statistical Society.
- ft Foot, feet, or fath.
- FZS Fellow of the Zoological Society.
- G or gm Gramme, the French weight.

# READING

G A. Georgia one of the states of U S A

G B Great Britain

G C B Knight Grand Cross of the Order of the Bath

G C H Knight Grand Cross of Hanover

G C H Knight Grand Commander of the Order of the Indian Empire

G C L H Grand Cross of the Legion of Honour

g c m Greatest common measure

C M G Knight Grand Cross of the Order of St Michael and St George

G C H Knight Grand Commander of the Order of the Star of India

G C V O Knight Grand Cross of the Royal Victorian Order

C F S Girls Friendly Society

g m Gramme

C M T Greenwich Mean Time

C O M Grand Old Man a term applied to the late Mr (C)linton

C I O General Post Office

g r Crown

g u Guinea

H B M His or Her Lady Anne

H C M His or Her Catharine

H C M His or Her Charlotte

H H His or Her Highness

H H His or Her Imperial Highness

H M His or Her Majesty

H M C His or Her Majesty's

H M S His or Her Majesty's

H M S His or Her Majesty's

H H His or Her Highness

H H His or Her Highness

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H H His or Her Highness

Ia or Io Iowa, one of the states of U S A

lb or liid. In the same place standing for the Latin word *Prædium*.

I C L Institute of Civil Engineers

I C S Indian Civil Service

Ida. Idaho one of the states of U S A

I D R Illust diamond buying

le Thus The letters stand for the Latin words of *est*.

I I S Jesus from the first three letters of the name when written in Greek capitals. It is some times erroneously supposed to stand for *Jesus Imanuel*.

Scholar three Latin words meaning Jesus Saviour of man.

Ill or Ills. Ills is one of the states of U S A

I L L Inverend at Labour Party

I M S Indian Medical Service

In Inch or inches

I N D In the Name of God stand for the Latin words *In Nomine Dei*

Ind. India, one of the states of U S A

Ind T Indian Territory a district in U S A

I N R I Jesus of Nazareth King of the Jews. The letters stand for the Latin words *Jesus Nazarenus Rex Judæorum* who were written above the cross.

Just have the same letters in Latin.

Ia or Ia Iowa one of the states of U S A

I O I Independent Order of Foresters

I O I In the name of God

I O I In the name of God

I O I In the name of God

I O I In the name of God

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I O I In the name of God

K C M G Knight Commander of the Order of St Michael and St George

K C S I Knight Companion of the Order of the Star of India

K C V O Knight Commander of the Victorian Order

Ken. or Ky Kentucky one of the states of U S A

Kg Kilogramme the French weight

K C Knight of the Carter

K C C Knight of the Cross

K C B Knight of the Grand Cross of the Bath

K C H Knight of the Order of Hanover

K C H Knight of the Order of Hanover

K M Kilmare, the French measure equal to the

K H Knight of the Order of St Patrick

K S I Knight of the Order of the Star of India

K T Knight of the Order of the Star of India

K L H Knight of the Order of the Star of India

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- L. s. d. Pounds, shillings, and pence, from the Latin *libra, solidi, denarii*
- Lt or Lieut Lieutenant
- £T Turkish pound = 18s
- M 1,000, from the Latin *mille*, a thousand
- M or Mons Short for Monsieur, the French word for Mr
- M A Master of Arts
- Mass Massachusetts, one of the states of U S A
- M B Bachelor of Medicine The letters stand for the Latin words *Medicinae Baccalarius*
- M C Master of Ceremonies
- Md Maryland, one of the states of U S A
- M D Doctor of Medicine The letters stand for the Latin words *Medicinae Doctor*
- Mlle or Mlle The French for Miss, being a contraction of *Mademoiselle*
- Mdm or Mme Madam
- Me Maine, one of the states of U S A
- ME Mining Engineer.
- M.F.H Master of Fox Hounds
- mg milligramme.
- M.I.C.E or M Inst.C.E Member of the Institute of Civil Engineers
- Mich. Michigan, one of the states of U S A
- Minn. Minnesota, one of the states of U S A
- Mis Missouri, one of the states of U S A
- Miss. Mississippi, one of the states of U S A
- Mlle See Mlle
- MM Short for Messieurs, the plural of Monsieur
- M M Their Majesties
- Mo Missouri, one of the states of U S A
- Mont Montana, one of the states of U S A
- M P. Member of Parliament
- M P.S Member of the Philological or of the Pharmaceutical Society
- Mr. Master or Mister.
- M R.A.S. Member of the Royal Academy of Sciences or of the Royal Asiatic Society.
- M R.C.C. Member of the Royal College of Chemistry.
- M.R.C.S. Member of the Royal College of Surgeons.
- M R.C.V.S. Member of the Royal College of Veterinary Surgeons.
- M.R.G.S. Member of the Royal Geographical Society.
- M.R.I. Member of the Royal Institution.
- M.R.I.A Member of the Royal Irish Academy
- Mrs Mistress
- MS Manuscript The plural is MSS
- MS Master in Surgery.
- msl Mean sea-level
- MSS Member of the Statistical Society.
- Mus B Bachelor of Music.
- Mus D Doctor of Music
- M V O Member of the Victorian Order
- N North
- N B Note well The letters stand for the Latin words *Nota bene* Also refers to North Britain, or Scotland, and to New Brunswick.
- N C North Carolina, one of the states of U S A
- N C O Non-Commissioned Officer
- N Dak North Dakota, one of the states of U S A.
- N E North east or New England
- Neb or Nebr Nebraska, one of the states of U S A
- Nev Nevada, one of the states of U S A.
- N.F Newfoundland
- N H New Hampshire, one of the states of U S A.
- N J New Jersey, one of the states of U S A
- N N E. North-north-east, the point in the compass midway between north and north-east
- N N W. North-north-west, the point in the compass midway between north and north-west
- No Number It is short for the Latin word *Numero*
- n o p Not otherwise provided
- N P. Notary public
- N S New style See O S
- N S Nova Scotia
- N S P.C.C National Society for the Prevention of Cruelty to Children.
- N W North-west
- N W T. North West Territories, in Canada
- N Y New York, one of the states of U S A.
- O Ohio, one of the states of U S A.
- Ob Died, standing for the Latin *Obit*
- O E Old English.
- O F Odd Fellow
- O H M S On His or Her Majesty's Service Ohms as a word means certain units used in electricity, so called from Professor Ohm.
- O K. All correct, from the American term *Ok Korrekt*
- Ont. Ontario, a province of Canada
- % Per-cent
- O.R.C Orange River Colony.
- Ore or Oreg Oregon, one of the states of U S A
- O.S Old style, referring to the Calendar, before its change in Queen Anne's reign.
- oz Ounce The z represents a curious character that was used in old manuscripts to denote an abbreviation
- p Page, the plural form is pp.
- Pa Pennsylvania, one of the states of U S A
- P.C Privy Councillor, police constable, or postcard
- P E I Prince Edward Island
- Penn Pennsylvania, one of the states of U S A.
- Ph B Bachelor of Philosophy The letters stand for the Latin words *Philosophiae Baccalarius*
- Ph D. Doctor of Philosophy. The letters stand for the Latin words *Philosophiae Doctor*
- P.M. Afternoon, standing for the Latin words *post meridiem*, postmaster of post-master The letters also stand for *post-mortem*, the examination of a dead body
- P.M.G Postmaster-general
- P.O. Post office, patent office, or postal order.
- P.O.D Paid on delivery.
- P.O.O Post office order.
- P.P. Parish Priest.
- pp Pages.
- P.P.C. To take leave. The letters stand for the French words *pour prendre congé*
- P P.S Additional postscript, see P S
- P.R.A. President of the Royal Academy
- P.R.I.B.A President of the Royal Institute of British Architects
- P.R.S President of the Royal Society
- P.S Pharmaceutical Society or Philological Society
- P.S Postscript—a part of a letter written after or below the signature of the writer, from the Latin *postscriptum*.
- P.T. Pupil teacher.
- P.T.O. Please turn over.
- Q E Which is. The letters stand for the Latin words *quod est*.
- Q E D. Which was to be demonstrated The letters stand for the Latin words *quod erat demonstrandum*.





## A FRENCH LESSON IN PICTURE: THE NAMES OF FAMILIAR THINGS AT THE SEASIDE



This picture enables us to learn quite easily the French names for the familiar things we see at the seaside. We have here the sand, pebbles, starfish, razor-shells, seaweed, and the boy in a jersey making sand pies round the sand castle. Two little girls, one in the straw hat and the other wearing bathing drawers, with a tan-o-shanter and tassel, stand near him. To the right a spade lies beside some shells, and the dog is carrying a walking-stick in the sea. In the distance are the breakwater, jetty, and harbour. On the left stands the nurse with shawl, bonnet, dress, and shoes, just out of reach of the foam washed in by the waves. A girl with a little bucket is piddling. On the sea there is a rowing-boat, fishing-boats with mast and sail, and a steamer with its smoke. At the end of the cliffs, and just above the horizon, stands the lighthouse. Clouds are in the sky.

The Child's Book of  
ALL COUNTRIES



This is a picture of the Russian Revolution. It shows the people fighting for freedom and a better life.

## THE MAKING OF RUSSIA

towns we know about in these regions are Kiev, on the Dnieper, and Novgorod, or Newtown just north of the Valdai Hills, easy of access to both the Baltic and the Volga. And here we have the kernel of the country afterwards called Russia.

It was about a thousand years ago, so the old story says, that three bold Viking brothers were invited from Scandinavia to settle and rule in Novgorod. "Our land is great and bountiful," runs the old message, "but there is no order in it. Come and rule over us." This story reminds us of that of Hengist

and Horsa settling in Kent, and it may be just about as true. Rurik, the chief of the brothers, in the end, gained sole power in the district, and founded a line of chiefs who gradually merged their Scandinavian nationality in that of the people whom they ruled, just as the Northmen did in France, and the Danes in England. But the old Norse daring showed itself when one of the chiefs hung his shield on the wall of Constantinople, and when nothing short of the terrible Greek fire, like lightning, could dislodge the ships that these adventurous and warlike Vikings brought.

Towards the end of the tenth century arose Vladimir, the first Christian ruler of the country, though, before his day, Queen Olga went to Constantinople to be baptised, and was called the "forerunner of Christianity in Russia, who shone in the midst of a heathen people." Vladimir also chose to belong to the Eastern, or Greek, Church, and ever since, for over 900 years, his country has kept faithful to that branch of the Church, and, indeed, has been its head since the cathedral of St Sophia became a mosque, as we read on page 315.

Through the centuries it has often been

able to hold out a helping hand to the smaller Slavonic countries, belonging to the same faith, when they were oppressed by their Mohammedan masters.

Vladimir insisted on his people being baptised in crowds, whether they wished it or not, just as happened under Clovis, as we read on page 2194. He was a conqueror, too, adding both Slavonic and Finnish tribes, especially on the side of Poland. But he had no thought of uniting all as one nation, for, on his death, he divided his kingdom among his sons. One of these is remembered as the first great law-giver of Russia,

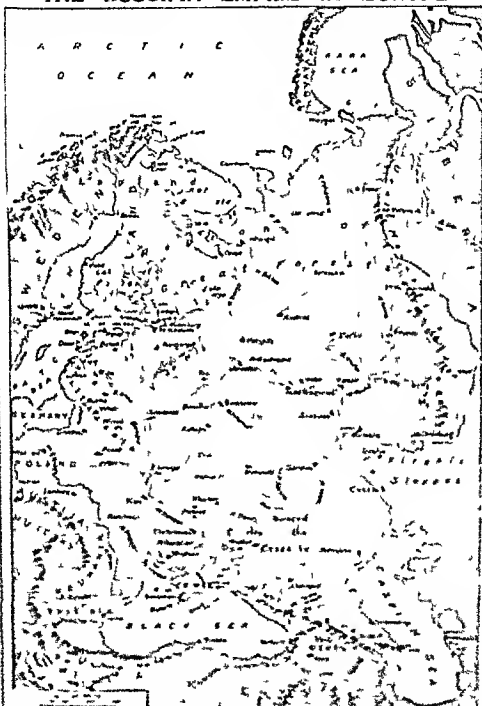


Rurik, the daring Viking, who, with his two brothers, conquered a great part of Russia in the ninth century, and founded a line of princes who ruled Russia for about 700 years.

and, in his code, we find how various crimes were punished by fines, and how trials were settled, as well as many other interesting details of life in Russia in this very early period of its romantic history. For about two centuries there now followed incessant civil wars. The custom of dividing up inheritances among several sons led to endless quarrels. Kiev was desolated by fire, Novgorod by famine. It was a gloomy time, and worse was to follow.

In 1224 a new and terrible danger came from without. Once more, hosts from Asia came sweeping westwards over the great plains south of the Urals. As we have seen, there were no mountain fastnesses in which the people could gather to defend themselves against the cruel invaders, the cities were poorly fortified, so there was nothing to stop the onward rush of the host of Mongols or Tartars, who came plundering and destroying all in their path. Novgorod for a long time held its own, it belonged to the Hanseatic League, and had a great trade, and chose its own princes. "Who can contend with God and great Novgorod?" became a proverb that showed its power and independence in those times. But elsewhere the Russian

# THE RUSSIAN EMPIRE IN EUROPE



1. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 2. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 3. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 4. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 5. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 6. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 7. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 8. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 9. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world. 10. The Russian Empire has not yet been declared as a nation, but it is a fact that it is a nation in the eyes of the world.

princes and dukes were obliged to do homage to the Tartars, to furnish soldiers to fight for them, and to pay them heavy taxes. There was no national life at this time, all was depressed. Many strong and large monasteries were built up and down the country, whither people could retire for peace and safety, and to the labours of the monks, who lived in them, we owe the chronicles and the stories that have been handed down, and are of such deep interest to those who study the history of Russia. Some of the old stories are sung to-day, by wandering minstrels, about Vladimir, the "shining sun," and Queen Olga, and many others who helped their country

#### THE BURNING OF MOSCOW CENTURIES BEFORE NAPOLEON WAS BORN

Among other cities burnt by the Tartars, more than once, was Moscow, then a small town, but in a famous position on a sub-tributary of the Volga, midway between the White, the Baltic, the Black, and the Caspian Seas. Later, much of the history of the country centred round Moscow, the capital of the Muscovites, as Russians are frequently called.

As time went on the Russian princes and nobles intermarried with the Tartars, and the Russians adopted from them many customs in manner and dress which they had brought from the East. Between Russia and the Baltic in those days were the Lithuanians, who remained heathen till the fourteenth century, and for a time they succeeded in holding some of the West Russian states and cities, including Kiev. Poland was united, too, to Lithuania for a time, and many struggles and quarrels arose both with each other, and with the neighbouring German states.

#### PRISONERS WHO WERE ROPED TOGETHER AND DRIVEN LIKE HERDS OF CATTLE

At the close of the fifteenth century the Russian princes succeeded in breaking up the Tartar power. The region on the northern shore of the Black Sea passed under the rule of the Turks, and was, for long, a bone of contention between them and their Russian neighbours, who were longing for ports and ships on this southern sea. Though the Tartars ceased, at this time, to be a terror to the country, their inroads continued for a century longer, and often miserable prisoners, roped

together, might be seen passing over the steppes eastwards, driven along with captured herds of sheep and cattle.

We come now to a time when the Russian princes rapidly became stronger, and succeeded in getting more and more power into their own hands. There are two—Ivan III and Ivan IV—who stand out in the fifteenth and sixteenth centuries. Ivan III. crushed the liberties of Novgorod, and annexed many cities and states, refused to do homage to the Tartar khan, or ruler, and made alliances with surrounding countries. He married the niece of the last Greek emperor, Constantine, who was slain at the taking of Constantinople by the Turks. Many learned Greeks came in the train of the princess, bringing with them valuable manuscripts. These found safe housing in the monasteries, that were ever growing stronger and richer.

Moscow was rebuilt, and progress was made in many ways. This Ivan III, called the Great, is considered to be the founder of the state of modern Russia.

#### THE TRAVELLERS TO RUSSIA WHO SALUTED A DYING BOY KING

From this time the double-headed black eagle, used by the Greek Empire, was adopted as the arms of Russia, and the title of tsar, or czar, by many thought to be derived from Cæsar, was assumed by her kings.

It was Ivan IV, a man of great power, though at times so insanely cruel that he is called the Terrible, who formally took the title of czar in 1547, after annexing many cities and states on the great plain, till his dominions reached to the south as far as Astakhan, on the Caspian, and also to the north as far as the White Sea and Siberia.

So Russia began to spread into Asia, and, reaching the White Sea, it at last had a chance of trading with distant countries, even though its port was ice-bound for a great part of the year.

We read on page 801, in the story of England, how the dying boy king, Edward VI., was saluted by the ships of Chancellor and his companions as they sailed past his windows at Greenwich on their way to the White Sea to open up trade with Russia. They had a very hearty welcome, for Ivan was anxious to trade, anxious to have workmen come to his country from the west, and the king

## THE GREAT CZAR PETER, MAKER OF RUSSIA



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a week's leave before being sent home as mentioned above.  
to a new duty station for the purpose of being transferred.



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of Poland, being his bitter enemy, would allow no passage through his dominions. Chancellor made his way from Aichangel to Moscow to display his wares, and, in spite of a most disastrous voyage home, the desired communication was opened up by way of the Arctic Ocean and a Russian ambassador and his suite, in gorgeous coats of velvet, with fringes of silk and chains of gold, made a splendid entry into London within two years of Edward's death.

Thus began much trade between Russia and England. Queen Elizabeth always wished to be on good terms with Russia, though she declined to marry Ivan. He could not understand her position towards her subjects, telling her that it was they who governed her, so limited was her authority. He considered that the lives of his people were his own property, and he put them to death whenever he pleased. When he died the empire was not only greatly enlarged, but it was in a better state of defence than it had ever been.

#### THE TYRANT RULERS WHO ENSLAVED A WHOLE NATION

It was left to the reign of Boris, a powerful noble of Tartar descent, to complete the enslavement of the Russian peasants, which had been gradually growing for several reigns. In 1597 a decree was made, forbidding peasants, or serfs as they were called, to leave the lands and estates on which they lived.

A miserable time of civil wars followed, chiefly on account of pretenders to the throne, and the country became a prey to its enemies. The Poles found their way to Moscow, in fact, there was a Polish czar for two years, and when they were driven out, the city suffered greatly. When differences arose with Sweden, Gustavus Adolphus was able to carry a treaty through, which completely shut out the Russians from the Baltic. "We will hope," said Gustavus to his council, "that the Baltic will always prove too wide a jump for them."

An attempt to limit the power of the Crown was made when Michael, the first of the Romanoff line, was proclaimed Czar of all the Russias; and there were many difficulties with the Boyars, as the nobles were called, also with the Cossacks. The Cossacks were adventurous robbers who were of a mixed race,

living in the south of Russia and Poland, the two chief tribes being those who lived on the Don and the Dnieper. They owed a nominal subjection to the Russians and to the Poles, and were organised into regiments, to serve as an advance guard to resist the Tartars and Turks. The Poles treated the Cossacks with great severity; and in the end they all owned Russia as chief over-lord, but they have always been very restless and difficult subjects.

#### THE BOY WHO BECAME CZAR AND GAVE HIS COUNTRY NEW LIFE

It was a Cossack who conquered a large part of Siberia, which was much visited by traders for its valuable furs, and presented it to Ivan the Terrible.

Towards the end of the seventeenth century, the direction of the affairs of Russia fell into the hands of a lad of seventeen. This was Peter the Great. He is said to have given new life to his country, so greatly did its fortunes change under his rule.

As a child he observed everything, and was fond of boats and engineering, and, as soon as he had a chance, he left Russia to go on his travels, and learn all he could from other nations. The Czar of Russia to-day owns a little hut, at Zaandam, in Holland, where Peter lived when he worked in the dockyard, and gained a certificate of efficiency in various handicrafts, which is still preserved.

Then he went to England, and lived at Deptford. There are only a few remains left of the house in which he lived, and at which he did a great deal of damage to the locks and grass lawn and holly hedges, but the street leading to it is still called after the Czar Peter. William III, our Dutch king, ordered a sham sea-fight at Spithead to amuse his royal visitor. The fruit of Peter's labours in the dockyards was the foundation of a navy for Russia; and in time Peter gained entrance to a western sea on which to float it.

#### PETER THE GREAT AND HIS WARS WITH THE LAST OF THE VIKINGS

We have seen how anxious Ivan IV. was to reach the Baltic, and how Sweden managed to secure the lands that bordered it. Charles XII, who is sometimes called the last of the Vikings, gained, as we see on page 3596, some brilliant victories over Peter and the King of Poland, in defence of the

# THE COSSACKS IN THE OLDEN DAYS



The subjection of the peasant classes to the nobles lasted longer in Russia than in any other European country and here we see peasants bringing bread and salt to their feudal lord - 180 years ago, not an act of homage



The Cossacks, who were ordered to meet the tsar in 1698, were undoubtedly those who were then bringing an offering of bread and salt to the tsar - Michael IV - who is said to have received them in 1698



The tsar, apparently, is to be seen in the center of the group, and the Cossacks are standing in front of him. The scene is set outdoors, possibly in a field or a clearing.



disputed territory; but at last Peter gained control of the river Neva, that flows into the Baltic by the Gulf of Finland. Peter renamed the place at its mouth, which had once belonged to Novgorod the Great Schlusselfburg, from the German *Schlüssel*, a key, he also gave a German name to the fort, Kronstadt, and to the new capital, St Petersburg, that he created to help to Russianise the long-desired Baltic.

#### THE NEW CAPITAL OF A GREAT EMPIRE THAT IS BUILT UPON A SWAMP

He lost no time in starting the foundations of his new city. It had to be built on piles, the site consisting of swampy islands on the Neva. Thousands of workmen were brought from their homes to build churches and fortresses, palaces and houses, of every kind.

But Peter was not only a builder; he was a great reformer. He made new regulations for the government of the Church, altered the customs of society, forbade all Eastern habits brought in by the Tartars, insisted on people shaving, and did all in his power to make Russia like Western Europe. When he went for his second tour, he visited France, and, hating pomp, he refused the Louvre as his place of residence. It is told how he held the little king, Louis XV, in his arms. He built canals, had books translated, founded libraries and museums, and travelled with unflagging energy all over his dominions. We shall find many traces of his visits when we read the story of Russia of to-day.

Peter's ambitions were not confined to the western sea. He took a most important step when he seized Baku, on the Caspian Sea, for here are the wonderful oil-wells that to-day bring much wealth into Russia, also the Caspian Sea has proved very useful as a thoroughfare.

#### HOW WOMEN RULED RUSSIA AFTER THE DEATH OF PETER THE GREAT

There were sad sides to Peter's life and character, but one likes to remember how much good he did, how simple were his tastes, and to think of him sitting in an old coat, smoking, with some newly arrived Dutch or English skipper, hearing the latest news in ship-building and trade. This greatly horrified his grand nobles. Peter's reforms were stopped for a time after his death, and there was much misery in the country from factions,

palace revolutions, assassinations, and banishments to far-distant Siberia. It has been called the time of the rule of women. Catherine I, Peter's widow, a peasant who could neither read nor write, succeeded him, and in her short reign Behring, a Dane, was sent exploring to Kamchatka. His name was given to the straits, some forty miles wide, that separate Asia from America. When Peter's niece, Anne, came to the throne, another attempt was made to lessen the power of the Crown, and give some measure of self-government to the people, but it failed, and during Anne's reign there was much tyranny by adventurers and others, who succeeded in making her do as they wished.

After her came Elizabeth, the daughter of Peter the Great. In her reign Russia gained the south part of Finland. This country had been converted to Christianity by two Englishmen, St Henry and St. Thomas, in the twelfth and thirteenth centuries.

#### THE RETURN OF THE EXILES FROM SIBERIA AFTER THIRTY YEARS

For a long time, Finland was a Swedish province, and sent representatives to the Swedish Diet. Many towns rose up over the picturesque country, and the Finlanders advanced steadily in civilisation, in spite of many attacks. They have enjoyed considerable liberty, and have developed a most striking and charming national character.

In Elizabeth's time, Russia joined in the European war against Frederick the Great, whose fortunes were at then lowest ebb when the empress died, and her successor, who was an ardent admirer of the Prussian king, and his nephew, made peace with him, and renounced the conquests that had been made. This was Peter III. A strange sight it must have been at his court, when he recalled from Siberia the exiles who had been banished long years before in the various palace quarrels and revolutions of preceding reigns. Some of them had been exiled for thirty years.

Peter was followed by his wife, Catherine II, generally called the Great. Hers was a long and eventful reign, as full of interest as that of Peter the Great. She made many enemies by taking away the lands and peasants belonging to the Church to be the property of the State. The Church had

## THE MAKING OF RUSSIA

become enormously rich and there were great numbers of monasteries and clergy in all parts of the country.

Poland at this time was breaking up and Russia had a large share of this kingdom. Important as this was, still more advance in the development of the country was made when at last after many attempts Russia reached the Black Sea.

A war with the Turks led to the independence of the Crimea and Azov was ceded to the Russians. Later the Crimea was annexed. Catherine made a journey to this new part of her dominions meeting the Empress Francis

away corn was founded also the important fort of Sevastopol was built. Among the famous generals of Catherine's day was Suvorov who distinguished himself in the wars against Frederick the Great of Prussia against Poland against the Turks and in the reign of her son Paul in the wars of the French Republic.

Just before Paul's death the ancient kingdom of Georgia between the Black and Caspian Seas south of the Great Caucasian Mountains was surrendered to Russia by its last prince. This interesting country had a very ancient Christianity and long lines of native



When Napoleon and his army annihilated the army of Alexander they were on the plain of the golden domes lighted up by the brilliant sun. The city of Moscow was then the capital of the Russian Empire. It was a scene of great beauty and the city of Moscow was the capital of the Russian Empire. It was a scene of great beauty and the city of Moscow was the capital of the Russian Empire.

Joseph II of Austria at Koenigsberg near the mouth of the Dniester and she must have greatly admired its soft beauty and its vastness. It was so utterly different from almost all other parts of Europe.

There were not many great cities in the East, but in this region a very large and important city was found. When Catherine II, the Empress, arrived in the city of Koenigsberg, she found it a very different place from what it was when she first saw it. It was a city of great beauty and its vastness was so utterly different from almost all other parts of Europe.

It was a city of great beauty and its vastness was so utterly different from almost all other parts of Europe. It was a city of great beauty and its vastness was so utterly different from almost all other parts of Europe. It was a city of great beauty and its vastness was so utterly different from almost all other parts of Europe.

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Napoleon and the Czar of Russia met on a raft in the river Niemen and agreed to divide Europe between them. But Alexander's subjects were ill-satisfied, for a quarrel with England meant much loss of trade. Later, Alexander did not keep to the arrangement he had made with Napoleon, and ventured to neglect his directions against English trade.

#### HOW THE RUSSIANS BURNED THEIR CAPITAL IN ITS HOUR OF DOOM

This angered Napoleon greatly, and we read, on page 825, of the gathering of the Grand Army and its march across Europe to punish Russia. With stubborn courage, the Russians fell back, and yet farther back, till, at last, the French hosts were in sight of Moscow. The Russians determined to sacrifice their splendid and sacred city, and to let the French enter without striking a blow. So the troops and inhabitants retired, removing, in haste, valuables of every kind. When the invading army first saw the brilliant domes of the city, especially of the Kremlin quarter, where fortresses, palaces, and cathedral form a grand sight, loud shouts of triumph, "Moscow! Moscow!" burst from them. They were astonished to find it empty, and no sooner were they settled in the city than fires burst out. In six days, nine-tenths of it were destroyed. Napoleon waited five weeks in the smoking ruins, hoping that Alexander would treat for peace, but he made no sign, and the French had to retire, beaten by the terrible foes of cold and starvation.

In the reign of Nicholas, renewed efforts to obtain a constitution were made, and, in a war with Persia, two provinces were gained that became steps on the way to Central Asia.

Later in the century, the Russian boundary was extended to within a few hundred miles of the frontier of India, and, by a treaty with China, the Russians gained the left bank of the Amur river, and founded Vladivostock, the "Lord of the East," on the Sea of Japan.

#### HOW POLAND FOUGHT FOR FREEDOM AND LOST ITS NATIONAL LIFE

As we read in the story of the Balkan Peninsula, beginning on page 3149, all through the nineteenth century struggles for freedom from Mohammedan masters have often involved interference by Russia, as head of the Greek Church, to which most of the oppressed states

belong. This interference caused many wars. The Poles made brave efforts for freedom, that finally resulted in the loss of the constitution which had been granted, many other rights were taken away, and Poland was declared a Russian province in 1864.

France and England declared war against Russia in 1854, because they were afraid, if the Turks were driven out of Europe, Russia would seize Constantinople, and become too powerful. So the Allies invaded the Crimea, bombarded Odessa, and also sent a fleet to the Baltic. There are many who still remember the excitement, as news of the war reached England. The passage of the Alma, the siege of Sevastopol, the battle of Inkerman, followed in succession. The brilliant charge of the Light Cavalry at Balaklava is described in Tennyson's poem on page 1782.

"It is magnificent," said a French onlooker, "but it is not war!"

#### THE SETTING FREE OF THE SERFS AND THE KILLING OF THEIR LIBERATOR

Many still remember, too, the indignation felt at the mismanagement of the war, and the needless sufferings of our soldiers for want of proper clothing and food, and the delirious joy of the country at the proclamation of peace. Miss Florence Nightingale's hospital for the sick soldiers was at Scutari, opposite Constantinople, and the remains of many of our soldiers rest there, under the dark cypress-trees.

In the reign of Alexander II, the serfs, whose condition had been slowly improving, were set free in 1861. Many other reforms were set on hand: railways were begun, trade and industries were encouraged. But for years Russia has been struggling for a constitution, which is still delayed, and the reforms of other kinds, which are slowly making their way in the vast empire, move too slowly for many ardent patriots, who often get into sore trouble for speaking, or writing, or plotting against the authorities.

Alexander, the liberator of the serfs, was killed by a bomb, after many repeated attacks on his life. His son, Alexander III, married the sister of our Queen Alexandra, and their son, Nicholas II, is now czar, with a score of titles besides, for his dominions take in half of Europe and a third of Asia. The next story of Countries is on page 3715.

# The Childs Book of POETRY

## WORDSWORTH'S GREATEST POEM

WE have read many of Wordsworth's poems in this book, and we are now to read the greatest of all the many poems he wrote, though by no means the longest. Many people may think that it is too difficult for children to understand but children can understand far more than is often supposed and there is no real reason why they should not read this famous ode with some explanations. Its full title is "Intimations of Immortality from Recollections of Childhood." That is to say the poet in manhood seeks to base his belief in the future life on recollections of the thoughts that came to him as a boy. Surely that fact alone makes his great poem a suitable one for printing in this book.

## ODE ON IMMORTALITY A POET'S MEMORIES OF HIS CHILDHOOD

The poet begins by stating that the dream of immortality which he had made the earth and its eyes had looked down on him when he was a child. He then says that he had been told that the things which he had seen in his childhood were the things which he would see in his old age.

There was a time when in a low  
grove and stream  
The earth and every common sight  
To me did seem  
Apparied in celestial light  
The glory and the freshness of a dream  
It is not now as it hath been of yore  
Turn whereoe'er I may  
My night and day  
The things which I have seen I now can  
see no more

He then goes on to say that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age. He then says that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age. He then says that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age.

He then goes on to say that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age. He then says that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age. He then says that he has seen the things which he has seen in his childhood, and that he has seen the things which he has seen in his old age.

Doth every least keep  
to play —

Thou child of joy

Shout round me let me hear  
thy shouts thou happy shepherd boy!

IV

Let us be like the birds that sing  
as they fly over the green  
hills and the valleys of the land  
let us be like the birds that sing  
as they fly over the green  
hills and the valleys of the land

Ye blessed creatures I have heard it call  
to each other make I hear

The heav'ns laugh with you in your play  
My heart is at your festival

My heart is at your festival  
My heart is at your festival

O evil day that I was born  
O evil day that I was born

When the earth first I saw  
When the earth first I saw

And the children are pulling  
And the children are pulling

In a thousand ways far and wide  
In a thousand ways far and wide

And the little ones are pulling  
And the little ones are pulling

I hear I hear what you say  
I hear I hear what you say

And the children are pulling  
And the children are pulling

And the children are pulling  
And the children are pulling

And the children are pulling  
And the children are pulling

And the children are pulling  
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And the children are pulling  
And the children are pulling

And the children are pulling  
And the children are pulling

The Youth, who daily farther from the East  
Must travel, still is Nature's Priest  
And by the vision splendid  
Is on his way attended,  
At length the man perceives it die away,  
And fade into the light of common day

VI

It may be, the poet suggests that our present existence here on earth, with all its distractions and pleasures, has dulled in us the memory of the "imperial palace" or heaven, whence our souls have come, just as the experiences of manhood and age certainly dull in us the memories of our childhood. Earth fills her lap with pleasures of her own. Yearnings she hath in her own natural kind, And even with something of a mother's mind, And no unworthy aim,

The homely Nurse doth all she can,  
To make her foster-child, her inmate Man,  
Forget the glories he hath known,  
And that imperial palace whence he came

VII

The thought expressed in the previous stanza is followed further in the next. But we are to remember that the poet never asserts as a fact that he believes in a past existence. The idea is a very old one and is a feature of some religions, such as Buddhism, and the poet suggests it for a poetic purpose which will presently appear. Behold the Child among his new-born blisses,  
A six years' darling of a pigmy size!  
See, where 'mid work of his own hand he lies,  
Fretted by sallies of his Mother's kisses,  
With light upon him from his Father's eyes!  
See, at his feet, some little plan or chart,  
Some fragment from his dream of human life,  
Shaped by himself with new-born learned art;

A wedding or a festival,  
A mourning or a funeral,  
And this hath now his heart,  
And unto this he frames his song  
Then he will fit his tongue  
To dialogues of business, love or strife;  
But it will not be long  
Ere thus be thrown aside,  
And with new joy and pride  
The little Actor cons another part,  
Filling from time to time his "humorous stage"

With all the persons, down to palsted age,  
That Life brings with her in her equipage,  
As if his whole vocation  
Were endless imitation

VIII

The poet now addresses the child. The little boy, the little girl, is the greatest wonder of the world! For in his little body is the seed of everlasting life, he is "glorious in the sight of heaven-born freedom" but, as the years grow upon him and make the wonders of the world commonplaces to him, he will become less and less conscious of the wonders he moves among, "custom" will "lie upon him, he will do his daily work with far too little thought of his immortal powers. Thou, whose exterior semblance doth belie  
Thy soul's immensity,

Thou best Philosopher, who yet dost keep  
Thy heritage, thou Eye among the blind,  
That, deaf and silent, read'st the eternal deep,  
Haunted for ever by the eternal mind,—

Mighty Prophet! Seer blest!

On whom those truths do rest,  
Which we are toiling all our lives to find,  
In darkness lost, the darkness of the grave,  
Thou, over whom thy immortality  
Broods like the day, a master o'er a slave,  
A presence which is not to be put by,  
Thou little Child, yet glorious in the might  
Of heaven-born freedom on thy being's  
height,

Why with such earnest pains dost thou  
provoke  
The years to bring the inevitable yoke,  
Thus blindly with thy blessedness at strife?  
Full soon thy soul shall have her earthly  
freight,  
And custom lie upon thee with a weight,  
Heavy as frost, and deep almost as life!

IX

Yet, just as it times these visions of our childhood rise again in our mind, so must we in our later years, when our knowledge is ripened, realize that these visions have a mighty power in opening for us the very pathways of immortality. They are not so much to be regarded as glimpses of a life that is past, as of an immortal life of the soul which endures for ever. The very fact that such thoughts ever arise in us is a proof that there exists for us some other life beyond the life we are living in this world to lay. They are like the echoes, far away in the faint of a great sea, that are the immortal life of the soul, and death is but the beginning of our heavenly voyage, our hurrying on the immortal sea.

O joy! that in our embers  
Is something that doth live,  
That nature yet remembers  
What was so fugitive!

The thought of our past years in me doth breed  
Perpetual benediction not indeed  
For that which is most worthy to be blest;  
Delight and liberty, the simple creed  
Of childhood, whether busy or at rest,  
With new fledged hope still fluttering in his  
breast —

Not for these I raise

The song of thanks and praise,

But those obstinate questionings

Of sense and outward things,

Fallings from us, vanishings,

Blank misgivings of a Creature

Moving about in worlds not realised,

High instincts before which our mortal Nature

Did tremble like a guilty thing surprised

But for those first affections,

Those shadowy recollections,

Which, be they what they may,

Are yet the fountain light of all our day,

Are yet a master light of all our seeing;

Uphold us, cherish, and have power to make

Our noisy years seem moments in the being

Of the eternal Silence truths that wake,

To perish never,

Which neither listlessness, nor mad endeavour,

Nor Man nor Boy,

Nor all that is at anity with joy,

Can utterly abolish or destroy!

Hence, in a season of calm weather,

Though inland far we be,

Our souls have sight of that immortal sea

Which brought us hither,

Can in a moment travel thither,

And see the children sport upon the shore,

And hear the mighty waters rolling evermore

X

Thus, at last in our old age even when worldly knowledge may have dulled our childhood's memories the joyous feelings of our early years may yet awaken within us, and our ripened senses should tell us that these feelings are the very truth of God speaking to us, not in words, but in a way no words can speak, of the immortal life to which we are born, if we only have "the faith that lool's through death"

Then sing, ye Birds, sing, sing a joyous song!

And let the young Lambs bound

As to the tabor's sound!

We in thought will join your throng,

Ye that pipe and ye that play,

Ye that through your hearts to-day

Feel the gladness of the May!

## THE HEAVEN THAT LIES ABOUT A CHILD

[illegible]

What though the radiance which was once  
so bright  
Be now for ever taken from my sight,  
Though nothing can bring back the hour  
Of splendour in the grass, of glory in the  
flower,  
We will grieve not, rather find  
Strength in what remains behind  
In the primal sympathy  
Which having been must ever be,  
In the soothing thoughts, that spring  
Out of human suffering,  
In the faith that looks through death,  
In years that bring the philosophic mind

XI

So that, in the end, when we are old, if we have preserved  
our faith, though we may have lost the keen sense of  
wonder and delight we enjoyed in childhood, we shall still,  
in a different way, rejoice in all God's beautiful creation.  
The glory of the setting sun is the glory of our lives if we  
have lived righteously in the eye of God. When the sun of  
our life sets, it will rise again in the other world that  
endures for ever and is known to us as heaven. Thus  
do we see how, from the recollections of his own childhood,  
the poet is led to believe in the undying life of the soul.

And O, ye Fountains, Meadows, Hills, and  
Groves,

Think not of any severing of our loves!  
Yet in my heart of hearts I feel your might;  
I only have relinquished one delight  
To live beneath your more habitual sway  
I love the Brooks which down their channels  
fret,

Even more than when I tripped lightly as they,  
The innocent brightness of a new-born Day  
Is lovely yet,

The Clouds that gather round the setting sun  
Do take a sober colouring from an eye  
That hath kept watch o'er man's mortality,  
Another race hath been, and other palms are  
won

Thanks to the human heart by which we live,  
Thanks to its tenderness, its joys, and fears,  
To me the meanest flower that blows can give  
Thoughts that do often lie too deep for tears

THE DESERTED HOUSE

Tennyson here reads us a little lesson in life and immor-  
tality. The deserted house may be likened to the earthly  
body of man when death has taken possession of it and the  
soul has gone away to live "in a mansion incorruptible."

LIFE and Thought have gone away  
Side by side,  
Leaving door and windows wide—  
Careless tenants they!

All within is dark as night;  
In the windows is no light;  
And no murmur at the door,  
So frequent on its hinge before

Close the door, the shutters close,  
Or thro' the windows we shall see  
The nakedness and vacancy  
Of the dark, deserted house

Come away. No more of mirth  
Is here, or merry-making sound  
The house was builded of the earth,  
And shall fall again to ground

Come away—for Life and Thought  
Here no longer dwell;  
But in a city glorious—  
A great and distant city—have bought  
A mansion incorruptible  
Would they could have staid with us!

MY COUNTRY, 'TIS OF THEE

This song, written in 1832 by an American Baptist clergy-  
man named Samuel Francis Smith, has long been regarded  
as the national hymn of the American people, breathing,  
as it does, the spirit of liberty which the government  
of that country is supposed to secure to its citizens

MY country, 'tis of thee,  
Sweet land of liberty,  
Of thee I sing,  
Land where my fathers died,  
Land of the pilgrim's pride,  
From every mountain side  
Let freedom ring,  
My native country, thee—  
Land of the noble free—  
Thy name—I love,  
I love thy rocks and rills,  
Thy woods and templed hills;  
My heart with rapture thrills  
Like that above

Let music swell the breeze,  
And ring from all the trees  
Sweet freedom's song:  
Let mortal tongues awake,  
Let all that breathe partake;  
Let rocks their silence break—  
The sound prolong

Our father's God, to Thee,  
Author of liberty,  
To Thee we sing  
Long may our land be bright  
With freedom's holy light,  
Protect us by Thy night,  
Great God, our King

AT LAST

John Greenleaf Whittier, the Quaker writer, lived to 85, and  
towards the end of his life could sing with undimmed  
faith of his simple all-sufficing trust in God, as in this poem

WHEN on my day of life the night is falling,  
And in the winds from unsummed spaces  
blown,

I hear far voices out of darkness calling  
My feet to paths unknown

Thou who hast made my home of life so  
pleasant,

Leave not its tenant when its walls decay,  
O, Love divine, O, Helper ever present,  
Be Thon my strength and stay!

Be near me when all else is from me drifting  
Earth, sky, home's pictures, days of shade  
and shine

And kindly faces to my own uplifting  
The love which answers mine

I have but Thee, O Father! Let Thy Spirit  
Be with me then to comfort and uphold,  
No gate of pearl, no branch of palm I merit,  
Nor street of shining gold

Suffice it if—my good and ill unreckoned,  
And both forgiven through Thy abounding  
grace—

I find myself by hands familiar beckoned  
Unto my fitting place

Some humble door among Thy many mansions  
Some sheltering shade where sin and  
striving cease,

And flows for ever through heaven's green  
expansions

The river of Thy peace  
There, from the music round about me stealing,  
I fain would learn the new and holy song,  
And find, at last, beneath Thy trees of healing,  
The life for which I long

## FATHER IS COMING

Onpa 355 we re d Mary II wite wyes on Th Spider  
and he fly and here weh ve th acme in ter we  
hat d'll i n, cel i x simp strama doe f  
th wess f m u and i ct d'hood on of th pleasa e  
e on of ry day be it th cau t y the tow

The clock is on the stroke of six  
 The father's work is done  
 Sweep up the hearth and mend the fire  
 And put the kettle on  
 The will night wind is howling cold  
 The dreary crowsing o'er the wall

He is crossing o'er the wolf and ape  
He is stronger than the storm  
He does not feel the cold, not he  
His heart it is so warm  
For father's heart is stout and true  
As ever human bosom knew

He make all toil all hardship light  
 Would all men were the same  
 So ready to be pleased so kind  
 So very slow to blame  
 Fools need not be unkind as I  
 For love hath render will than I  
 Nay do not close the shutters chide  
 For far along the line  
 The little window looks and he  
 Can see it shining plain  
 I heard him say he loves to mark  
 The cheerful bright through the dark

And we'll do all that father like  
His wishes are all law  
Would it were more! that every hour  
Some wish of his I knew!  
I'm sure it makes a happy day  
When I can give him any way  
I know he's coming by the sign  
That baby's next will  
See how he laughs and crows and stuns—  
Heaven bless his eyes and all  
He's a father's self in fact and heart  
And just it's heart's strong religion  
Mark! Mark! I hear his feet steps now  
He's so rough the garden gate  
How I'll love and get the door  
And I'll not let him wait  
Gout! Gout! Gout! and clatter his feet  
His father on the stairs, his hands

## THE BUTTERFLY AND THE SNAIL

[illegible]

A  
A  
at  
W  
H  
P  
W  
I  
M  
D  
C  
I  
W  
E

Why wake you to the morning care?  
Why with new arts erect the war?  
Why grows the peach a crimson glo?  
And why the plum an inviting red?  
Were they to feast his taste and sight  
That vermin of voracious kind!  
Crush them the slow the pill-grinder  
— purge thy garden from detra-  
What arrogance! The annals read  
How insolent is upstart pride!  
Hast thou not thus with insult arm  
Provok'd my patience to compun?  
I had conceal'd thy meaner lust!  
Nor scarce thee to the scene of earth  
For scarce nine sins have wak'd thee here  
To swell the fruit and paint the flower  
Since I thy hunter life survey'd  
In haunts of sordid guile array'd  
I own my humble life good from  
Snail was I born and snail shall end  
And what is but a butt for? At best  
He but a caterpillar fire  
And all thy race (as numbers say) seeds  
Shall prove of caterpillar food

## BIG AND LITTLE THINGS

11 A and H Miley, his is one of our largest 1 of  
country and his complaint an inquiry is and but the  
Jews and Purvey of the 4 are 4 days 4 times  
part of his is a woman to his 4 give me 4 4 times  
it is a woman 4 of the place 4 times 4 times  
which covers 4 4 times 4 times 4 times 4 times

I CAN DO THE THINGS  
That I should like to do  
To make the earth for ever fair  
The sky for ever blue

I all can for small things  
That help to make the world  
The children arise and fill the  
And the world is full

I cannot stay the rain is we  
That tomb is here is here  
But I can write it as we  
I run into it as we

I cannot make it  
 But I can make it  
 The better a man

I cannot stay too long clean  
 Or not that I am up to  
 I can clear this one away  
 From foot & fire will be

I can't make it on my own  
 On my own I can't  
 But I can get some help with me  
 In fact it's my own

I came off a day of 4215 m 43  
 (4487 m) 4000 m 4100 m  
 7215 I came back to 4000 m 4100 m 4215 m  
 4400 m 4500 m 4600 m 4700 m 4800 m

I met a few people at the  
 meeting and I was  
 very happy to see them.  
 The meeting was very  
 good and I was  
 very happy to see them.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities related to the project. It emphasizes the need for transparency and accountability in financial management.



# LITTLE VERSES FOR VERY LITTLE PEOPLE

**T**HE man in the wilderness asked me,  
How many strawberries grew in the  
sea?

I answered him, as I thought good,  
As many as red herrings grew in the  
wood

**P**EG Peg, with a wooden leg,  
Her father was a miller;  
He tossed the dumpling at her head,  
And said he could not kill her.

**I** HAD a little moppet,  
I put it in my pocket,  
And fed it with corn and hay,  
There came a proud beggar  
And swore he would have her,  
And stole my little moppet away.

**S**IMON BRODIE had a cow,  
He lost his cow and could not find her,  
When he had done what man could do,  
The cow came home and her tail  
behind her

**T**HE King of Clubs, he often drubs  
His loving Queen and wife  
The Queen of Clubs returns his snubs,  
And all is noise and strife  
The Knave of Clubs gives winks and  
rubs,  
And swears he'll take her part  
For when our kings will do such things,  
They should be made to smart

The Diamond King I fain would sing,  
And likewise his fair Queen,  
But that the Knave a haughty slave,  
Must needs step in between  
"Good Diamond King, with hempen  
string  
This haughty Knave destroy"  
Then may your Queen, with mind  
serene,  
Your royal love enjoy"

The King of Spades he kissed the maids,  
Which grieved the Queen full sore,  
The Queen of Spades, she beat those  
maids  
And turned them out of door  
The Knave of Spades grieved for those  
jades,  
And did for them implore;  
The Queen so gent, she did relent,  
And vowed she'd strike no more

**M**ARY had a pretty bird,  
Feathers bright and yellow;  
Slender legs—upon my word,  
He was a pretty fellow.  
The sweetest note he always sung,  
Which much delighted Mary,  
She often, where the cage was hung,  
Sat hearing her canary.

**T**HE Robin and the Wren  
Fought about the porridge-pan,  
And ere the Robin got a spoon,  
The Wren had ate the porridge down.

**O**N Saturday night  
Shall be all my care  
To powder my locks  
And curl my hair.

On Sunday morning  
My love will come in,  
When he will marry me  
With a gold ring

**T**wo little dogs sat by the fire,  
Over a fender of coal-dust,  
When one said to the other dog,  
"If Pompey won't talk, why, I must."

**A**s little Jenny Wren  
Was sitting by the shed,  
She waggled with her tail,  
And nodded with her head

She waggled with her tail,  
And nodded with her head,  
As little Jenny Wren  
Was sitting by the shed

**H**U-H, baby, my dolly, I pray you  
don't cry,  
And I'll give you some bread and some  
milk by and by,  
Or perhaps you like custard, or may be  
a tart,  
Then to either you're welcome, with  
all my heart

**G**REAT A, little a, bouncing B,  
The cat's in the cupboard and she  
can't see.

**H**EY diddle, dinkety, poppety, pet,  
The merchants of London they  
wear scarlet,  
Silk in the collar, and gold in the hem,  
So merrily march the merchantmen



### TRIP UPON TRINDIES

To p. you trindies, and dave u on  
 d. the  
 I v. another sent me for some term u on  
 to me  
 She bid me tread light on. come again  
 to the  
 Ie keep a young man about do me  
 some harm  
 Yet didn't you see, yet didn't you see  
 They didn't see he they put upon me  
 They took my picture and know'd I  
 was there  
 And pulled my picture and over my  
 gown  
 And know'd my a very formal of me

# THE EMPEROR WALKED IN THE PROCESSION



The emperor walked under his high canopy in the midst of the procession, and all the people cried out "Oh, how beautiful are our emperor's new clothes!" "But the emperor has nothing on!" said a little child

The Childs Book of  
STORIES



THE EMPEROR'S NEW CLOTHES

So the faithful old minister went into the hall, where the knaves were apparently working with all their might at their empty looms.

"What can be the meaning of this?" thought the old man, opening his eyes very wide "I cannot discover the least bit of thread on the looms!"

However, he did not express his thoughts aloud.

The impostors requested him to be so good as to come nearer their looms, and then asked him whether the design pleased him, and whether the colours were not very beautiful, at the same time pointing to the empty frames. The poor old minister looked and looked but he could not discover anything on the looms, for a very good reason—there was nothing there.

"What!" thought he again, "is it possible that I am a simpleton? I have never thought so myself, and, at any rate, if I am so, no one must know it. Can it be that I am unfit for my office? No, that must not be said either. I will never confess that I could not see the stuff."

"Well, sir minister," said one of the knaves, still pretending to work, "you do not say whether the stuff pleases you."

"Oh, it is admirable!" replied the old minister, looking at the loom through his spectacles. "This pattern, and the colours—I will tell the emperor how very beautiful I think them."

"We shall be much obliged to you," said the impostors, and then they named the different colours and described the patterns of the pretended stuff. And then the knaves asked for more silk and gold, saying that it was necessary to complete what they had begun. However, they put all that was given them into their knapsacks, and continued to work with as much apparent diligence as before at their empty looms.

The emperor now sent another officer of his court to see how the men were getting on, and to find out whether the cloth would soon be ready. It was just the same with this gentleman as with the minister, he surveyed the looms on all sides, but could see nothing at all but the empty frames.

"Does not the stuff appear as beautiful to you as it did to my lord

the minister?" asked the impostors of the emperor's second ambassador.

"I certainly am not stupid!" thought the messenger. "It must be that I am not fit for my good, profitable office! That is very odd; however, no one shall know anything about it!" And accordingly he praised the stuff he could not see, and declared that he was delighted with both colours and patterns. "Indeed, please your Imperial Majesty," said he to his sovereign, when he returned, "the cloth which the weavers are preparing is extraordinarily magnificent."

And now the emperor himself wished to see the costly manufacture, while it was still on the loom. Accompanied by a select number of officers of the court, among whom were the two honest men who had already admired the cloth, he went to the crafty impostors, who, as soon as they were aware of the emperor's approach, went on working more diligently than ever, although they still did not pass a single thread through the looms.

"Is not the work absolutely magnificent?" said the two officers of the crown already mentioned. "If your Majesty will only be pleased to look at it! What a splendid design! What glorious colours!" And at the same time they pointed to the empty frames, for they imagined that everyone but themselves could see this exquisite piece of workmanship.

"How is this?" said the emperor to himself. "I can see nothing. This is indeed a terrible affair! Am I a simpleton, or am I unfit to be an emperor? That would be the worst thing that could happen. Oh, the cloth is charming!" said he aloud. And he smiled most graciously, and looked closely at the empty looms, for on no account would he say that he could not see what two of the officers of his court had praised so much. All his retinue now strained their eyes, hoping to discover something on the looms, but they could see no more than the others. Nevertheless, they all exclaimed "Oh, how beautiful!" and advised his Majesty to have some new clothes made from this splendid material for the procession that was going to take place very soon. The two rogues sat up the whole of the night before the day on which the

procession was to take place and had sixteen lights burning so that everyone might see how anxious they were to finish the emperor's new suit. When the day arrived they came to the palace with huge boxes.

If your Imperial Majesty will I graciously pleased to have your clothes taken off we will fit on the new suit in front of the looking glass," they said.

The emperor was accordingly undressed and the rogues pretended to array him in his new suit; the emperor turning round from side to side before the looking glass.

How splendid his Majesty looks!

lifting up the ends of the mantle and pretended to be carrying something for they would by no means betray anything that looked like simplicity or unfitness for their office.

So now the emperor walked under his high canopy in the midst of the procession through the streets of his capital and all the people standing by in the windows cried out:

Oh how beautiful are our emperor's new clothes! What a magnificent train there is to the mantle and how gracefully the suit hangs! In short, no one would allow that he was unclothed.



WHEN THE DAY ARRIVED THE ROGUES CAME TO THE PALACE WITH HUGE BOXES

how well it is and how well they are even as they went out. What a fine suit it was!

The emperor was so pleased with the new suit that he gave a great feast to all the courtiers.

But the two rogues who had made the new suit were not so pleased. They were afraid that the emperor would find out that they had been deceived.

So they decided to run away with the emperor's new suit and hide it in a secret place.

For the emperor was so pleased with the new suit that he gave a great feast to all the courtiers.

But the two rogues who had made the new suit were not so pleased. They were afraid that the emperor would find out that they had been deceived.

So they decided to run away with the emperor's new suit and hide it in a secret place.

# SCRAMBLEPIPE TRIES TO UNDERSTAND

The Gnomes who Set Out for Christmas and Found that the



World is Round ·



IT was the twenty-fourth of June. The twenty-fourth of June is Midsummer Day. Screwworm said to Scramblepipe, "Christmas is coming."

Every gnome had a vast respect for Screwworm. When Screwworm spoke, everybody listened. When Screwworm asked a question, everybody thought, reflected, took a turn round the garden, or sat with their heads in cold water, before making an answer. Screwworm, in short, was immensely wise.

Now, the only gnome who was not in his heart convinced of Screwworm's wisdom was Burrowjack. Burrowjack was a light fellow. Once a week he had a punning day. It was the same day as Mrs Burrowjack's washing-day. She filled the house with steam, he filled the air with puns.

When Screwworm said to Scramblepipe on Midsummer Day, "Christmas is coming," Scramblepipe immediately leant his brow upon his hand and plunged into profoundest thought. He knew that there was something deep in the idea. Screwworm had uttered it.

Burrowjack, who was sitting on a toadstool outside the cave, blowing bubbles with soap-water from his wife's wash-tub, pricked up his ears and listened.

"I can't get it," said Scramblepipe, after a long meditation. "I'm sorry, Screwworm; it's stupid of me, but I can't get it. *Christmas is coming*. No; I don't follow you. Perhaps if I went out, took a Turkish bath, and lay down for an hour or two, it might come to me and I might understand."

"*There isn't time*," said Screwworm. "Scramblepipe, make yourself easy. This is not a usual thought. It surprises me. It's TREMENDOUS!"

"Then I give it up," said Scramblepipe with a grateful sigh.

"It is, if I may say so," said Screwworm, "one of those ideas which come to the brain of only the wisest, and that only once in a million years. Be quite easy, Scramblepipe, but reverent; I will explain. Christmas is coming *because summer is going*. If summer is going, Christmas must be coming. Now, in a certain sense, it may be argued that,

while summer is here, Christmas cannot be here, too. But that is not my point. Summer undoubtedly is here, as much here as any one thing can ever be said to be here at all. But, what is Here? Have you ever seen. Here? Have you ever taken it in your hands, examined it, punched its head, heard it squeak, or counted its waistcoat buttons? *Has it got waistcoat buttons?* We are in profound ignorance. Scramblepipe, I will let you into a secret. I don't believe there is any such thing as Here."

"It's coming to me," said Scramblepipe thoughtfully.

"Now, if Christmas is coming," continued Screwworm, "it is something that is alive and real. Far from going, it is coming. The two movements are as different as life and death. If summer is going, it is something mortal; if Christmas is coming, it is something immortal. If we stay here waiting, while something is going, we shall be left."

"Oh, I feel as if I am being tickled all over!" exclaimed Scramblepipe, interrupting. "I've nearly got it, nearly, almost, practically got it; but not quite. It eludes me, just as I think I'm certain of it."

"A thing that is going is ceasing to be, a thing that is coming must exist, to be coming," said Screwworm.

Scramblepipe leaped to his feet.

"Got it! Got it!" he cried excitedly. He began to dance—singing, grinning, laughing, cackling, and whistling. Suddenly, he stopped dead, his face livid. "Screwworm," he said, "it has gone!"

"My point," said old Screwworm, "is this: a thing that is coming must have a place from which to come. If, instead of waiting for that thing to come, we go to the place from which it is coming, shall we not be in the possession of something that is never going at all? In other words, if——"

Scramblepipe buried his head in his hands.

"Come with me," said Screwworm kindly; "I will show you what I mean." They rose up and went out together.

# SCRAMBLEPIPE TRIES TO UNDERSTAND

Can you tell me said Burrow-pick  
 'who bids the field farewell? I am  
 speaking of the bird Say it or slowly  
 to yourselves this Who—bids—the  
 field—fare well

His mother said Scramblepipe (ran)  
 once he could take the trouble to se

For many days and nights these  
 intrepid explorers journeyed across the  
 earth to find Christmas Well and  
 months passed Their foot-prints  
 their shoes were worn to a thread  
 very stiff that they could not sit  
 their feet But still they journeyed on





One day they arrived at a place where snow was falling. Their eyes shone with enthusiasm as they saw it.

"I feel," said Screwworm, "like a king approaching his coronation. Columbus discovering America is not nearly big enough for my feelings."

Above this white earth the sky was glittering with stars. An immense moon shone through the trees.

"The moon looks very different," said Screwworm.

"There's no man in it, for one thing," said Scramblepipe. "It smells different."



SCREWORM AND SCRAMBLEPIPE SUDDENLY

"I never saw such a splendid country in my life!" exclaimed Scramblepipe.

"You can feel the very air is Christmas, can you not?"

"I can smell it!" cried Scramblepipe, with enthusiasm.

They travelled on. Night fell. The whole earth was buried under snow.

FOUND THAT THEY HAD ARRIVED AT HOME.

They travelled on and on until suddenly they heard a horn blow in the distance.

Screwworm fell on his knees. His face was dazzled with ecstasy. He waved his arms above his head.

"My idea!" he exclaimed. "My idea! I thought of it! Alone I got it! Oh, what it is to be a thinker!"



## LEGENDS OF PLACES AND THINGS

### THE FAIRY OF THE NEW FOREST

ONE midsummer's eve an old woodcutter was trudging back to his hut in the New Forest, with a small empty sack on his arm. He had carried two pennyworth of firewood in it to a distant farm, and as he approached his hut he began to complain aloud of his unhappy lot. Suddenly a beautiful little lady appeared, and said

"Now, would you really be content if I filled that sack with gold for you?"

"Yes, lady," said the woodcutter.

The beautiful little lady touched the sack, and it became filled with gold. The woodcutter lifted it on his shoulder, and then he put it down, saying

"But wait a minute! I have a larger bag at home."

But when he ran to fetch it the beautiful little lady touched the sack again, and when the woodcutter returned he found that the gold had been changed into yellow moss. So he was sorry he had not been content with what the lady had first given to him.

### FOR A YEAR AND A DAY

THE Forest of the Yew-tree is an enchanted wood in the parish of Llanwrin. As a lad and lass were strolling there one evening, they saw two elves come and draw a fairy ring round the yew-tree. A troop of fairies then entered the ring, with their musicians, and began to dance. They danced so well that the lad joined them and went whirling round the fairy ring, while the lass sat and watched them.

But hour after hour went by, and the lad still danced, and at daybreak he and the fairies vanished together, and the lass went home feeling lonely and broken-hearted.

One evening, as she was looking for him in the forest, she met an old woman, who told her to wait for a year and a day, and then return at night to the yew-tree. The lass did so, and there she saw her sweetheart still dancing merrily with the fairies in the fairy ring. She went as close up to him as she could without getting into the enchanted ring, and tried to drag him out of it.

"Just let me dance another minute," he cried, eagerly, pushing her aside.

"No, you've danced long enough,"

she said, and she seized him by the arm and pulled him away from the ring.

"I haven't been dancing five minutes!" he said, rather angrily.

And it was not until he got back to Llanwrin that he believed that he had really danced for a year and a day.

### THE CAULD LAD OF WILTON HALL

THE Cauld Lad of Wilton Hall was an elf with pointed ears and hairy skin, and he was the most mischievous thing that ever lived in a house. He used to get up when everybody was in bed, and play pranks in the kitchen. All sorts of ways were tried to lay him, but none succeeded, and he went about singing:

"The acorn's not yet fallen from the tree  
That's to grow the wood, that's to make the cradle,

That's to rock the bairn, that's to grow to the man,

That's to lay me."

But one night the kitchen-maid left a little cloak and hood for him, and he put it on, saying:

"I've taken your cloak, I've taken your hood,

The Cauld Lad of Wilton will do no more good."

And with that he vanished, and was never seen any more in Wilton Hall.

### THE DRAGON OF ST. LEONARDS

THERE are two strange things about St Leonards Forest, in Sussex: no nightingales sing there, and more lilies of the valley grow in it than in any other forest or wood. All this is St Leonard's doing.

St. Leonard was a soldier who wearied of war, and returned to the forest to live as a hermit. But, finding there a fierce dragon, he resolved to have a battle with the monster before laying his sword aside. So he knelt down to pray for victory. The nightingales disturbed him with their singing, and he said

"Go away!"

And they went away, and never returned. Then St. Leonard seized his sword and attacked the dragon, and, after a fearful struggle, he killed it. But he was grievously wounded, and, wherever his blood fell to the earth, the earth broke out into blossoms of white and beautiful lilies of the valley.



## A THIRD TALK ABOUT TREES

### A TREE AND THE WORLD'S LIFE

Most people know that trees are beautiful things. A great many people know that they are useful things. But few people perhaps realize that trees are absolutely essential to existence. History indeed is an arm in arm march of Man and Forest. Not only would man never have been able to advance from savagery without trees but without trees he could not have even been a savage. He could not have been at all.

Have we ever realized that in some senses the tree is the father of humanity?

Directly we begin to think about these things jump into our minds which show us the immense importance of trees. We see that an express train rushing with a great clatter of iron wheels across the earth is a forest in motion. The cars are mere leaves of the forest, the passengers are the sparrows which they seat the feet the rail which protects them from the clanges and changes of climate were never known to the kindly sun and motherly earth.

Not only is the tree and the wheel each a part, each a part as they were drawn to the

work could not have taken their part in the advance of humanity without fir and without trees there could be no life.

The steam shrieking to the wheels the smoke drifting from the funnel the sparks whirling into the air were no trees. Every one was once lodged in a tree. Every one was once a leaf in a tree every lump of coal was once a leaf in a tree. The death of the forest is the hurt of the sea field and out of the forest heaps the one called progress man the peace and salvation in his life.

Let us turn away from the train and where we look we shall see the same old activity of the forest. Our houses are built of the things that grow in the forest. When we sit down at our work we sit on a tree. When we cross the river we cross a tree. When we walk we walk on a tree. We are all built of the things that grow in the forest. We are all built of the things that grow in the forest. We are all built of the things that grow in the forest.

There is no life in the world if there were no trees. The world would be a dead world. The world would be a dead world. The world would be a dead world.

centuries of man's existence are divided by a tree, on one side the centuries before, and on the other the centuries after, the Cross of Christ. If we cross the desert of Sahara we find ourselves ploughing through an ocean of sand. Nothing will grow there. It is a dead land, profitless, empty, appalling. Now, the whole earth would be one hideous Sahara but for trees. And Sahara would not be a desert if it were covered by green-wood. The earth is what it is according to the presence or the absence of trees.

#### THE FORESTS THAT FORM AN UMBRELLA TO SHADE THE EARTH FROM THE SUN

Forests present to the sun an immense umbrella. They shield the soil from rays which would otherwise burn up into smoke-like dust the rich pastures of the earth's surface. Herbage, which grows under the shelter of this immense umbrella, is itself a form of sunshade, as it were, a doll's sunshade, it seeks to imitate the mighty forest by protecting the soil from the rays of the sun. Without trees the richest soil would soon perish and become a desert of sand.

For not only do forests intercept the scorching rays of the sun, driving them back from the earth, they also preserve the springs at their roots from the thirsty greed of those rays.

All the countries along the lovely Mediterranean Sea—Turkey, Italy, Spain, and France, though still beautiful in their colouring, and so pleasant in winter that people flock to them from all parts of the world, are, nevertheless, the ruin of what they once were.

Once upon a time these lands were fertile to an unusual degree, with plenty of springs to give them water for man and beast, and to give life to their crops. But the axe was laid to the root of the tree, the mighty forests covering those splendid mountains, and looking so useless and idle, were cut down.

#### HOW THE CUTTING DOWN OF THE TREES HAS DRIED UP THE EARTH

The result soon showed itself. The land grew sulky. The springs dried. Only in certain places was it possible for man to scrape together a living. We may now walk for a whole day along the Riviera without seeing a single bird. Far worse than the case of the

countries bordering the Mediterranean is the case presented to us by our own British India. When we read of a terrible famine ravaging that mighty continent like a wolf, sweeping away the inhabitants as if they were so many flies, we should remind ourselves that man's folly is the cause of this appalling havoc.

Once the mountain slopes of India were covered by magnificent forests; they were cut down and sold for money. The people did not realise that God makes a thing useful as well as beautiful. The beautiful trees, hewn down as a revolution hews down the gilded idlers of society, were in reality the most useful servants of India. It was those idle-looking trees which, in the blessed season of rain, drank up at a million million mouths the precious drops of moisture, and stored them up for that dread of India—the sunny day. Now, when the rain falls, there are few forests to catch it, the drops strike the earth, sink in, or slide to the rivers, and away they go to sea—water running away from a parched and arid land. The great forest was India's water-tap.

#### THE ENORMOUS VALUE OF TREES TO THE EARTH AND TO MAN

Trees, then, we see, not only do service to the soil, and not only preserve for our use the springs of water, but they also affect climate. The climates of countries are very largely influenced by the presence or absence of trees. Humboldt, the man of science, has summed up the service rendered by forests under three heads: (1) They screen the soil from the heat of the sun's rays, (2) their leaves offer an immense surface to the cooling process of radiation, (3) their leaves give off an incalculable evaporation of moisture.

From trees we get coal and materials for buildings, we get also valuable drugs, gums, dyes, and articles of food. But, above all these things, it is important to remember that trees influence the air and the soil of the country, that they oppose their quiet strength to the great enemies of our race—extreme heat and extreme cold, and that they have an all-important bearing on the hidden springs of the earth.

We should cultivate in ourselves a love for trees, and look upon them with something more than mere admiration.

# THE WALNUT, "THE FOOD OF THE GODS"

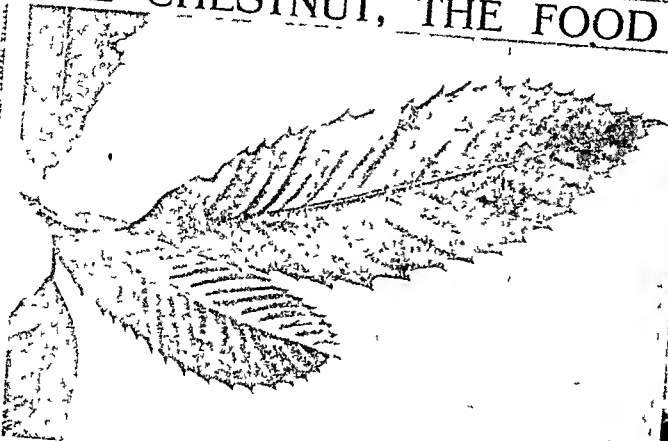


The walnut is a tree of the Thymelaeaceae family. It is a large tree, growing to a height of 100 feet. The leaves are pinnate, with 11 to 15 leaflets. The flowers are small and are borne in clusters. The fruit is a large, round, pitted nut, which is covered by a thick, fleshy, greenish-brown husk. The nut is divided into two halves, each containing a seed. The seed is large and is covered by a thin, brown, papery coat. The walnut is a very important food source for many animals, including birds and squirrels. It is also a very important source of oil, which is used in many industries. The walnut is a very beautiful tree, with its large, pinnate leaves and its large, round fruits. It is a tree that is well worth growing in any garden or park.

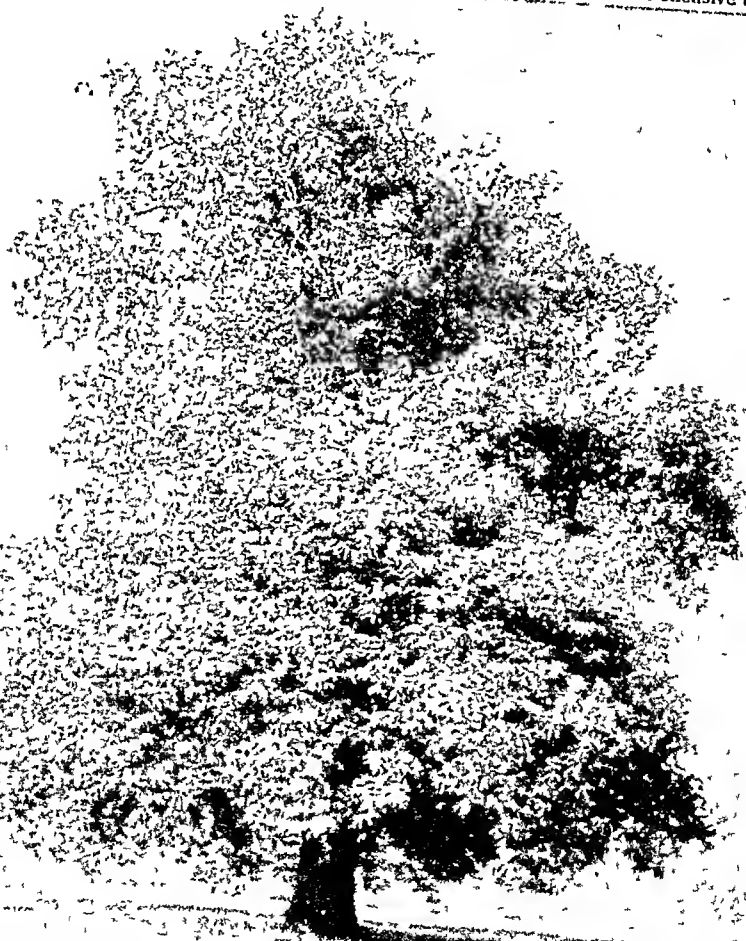


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# THE CHESTNUT, THE FOOD OF THE POOR

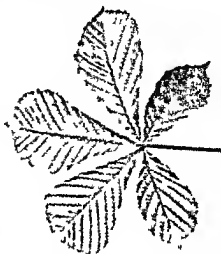


The handsome, glossy leaves of the Spanish chestnut, which are nine or ten inches long, change in autumn from a rich green to golden yellow, and then to brown, and when they fall they greatly improve the soil. The yellow flowers are small, but appear striking as they grow together. Their strong odour is offensive to many people.



The Spanish chestnut, which is also called the sweet, or the edible, chestnut, is the tree from which we get the well known roasted chestnut. In some parts of Italy poor people eat chestnuts instead of bread. Chestnut-trees grow to a great age. There is one at Tortworth that was called "the great chestnut" in King Stephen's reign.

# THE HORSE-CHESTNUT'S SILVER FLOWERS



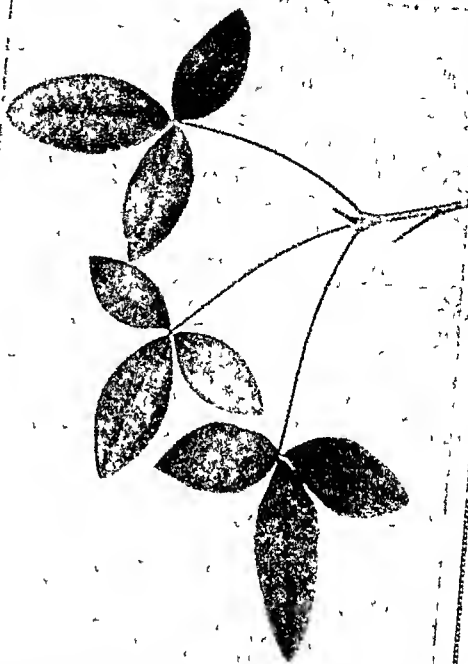
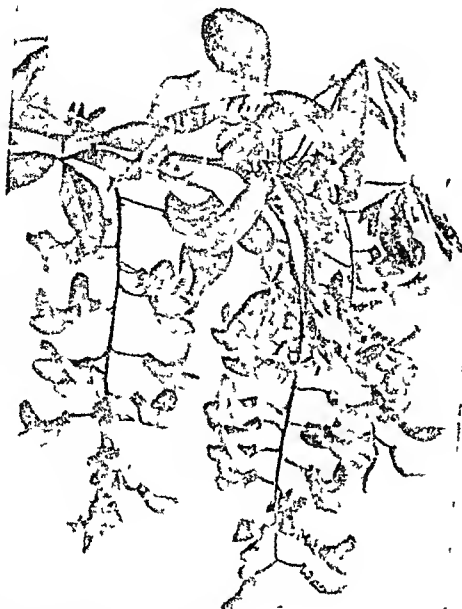
There is no flower sight in 2 June like a horse-chestnut in full bloom, and thousands of people go every year to see the horse-chestnuts in St. James Park near London when they are flowering. The leaf is 12 inches long and 4 inches wide, and it is as large as the leaves of the horse-chestnut tree.



The horse-chestnut tree is a very common tree in the parks and gardens of London. It is a very beautiful tree when it is in full bloom, and it is a very common sight in the parks and gardens of London. The horse-chestnut tree is a very common tree in the parks and gardens of London. It is a very beautiful tree when it is in full bloom, and it is a very common sight in the parks and gardens of London.



# THE LABURNUM'S GOLDEN EAR-RINGS



There is no prettier sight than the laburnum with its clusters of yellow flowers, like golden ear-rings

Leaves and flowers appear together in May, and the leaflets form in threes at the end of long, slender stalks.



The laburnum grows about thirty feet high, but does not throw out very long branches. It is not found wild, probably because rabbits are so fond of eating the tiny young trees, although these are poisonous to cattle

# THE LOCUST-TREE'S SILVER CHAINS



The locust tree is so called the false acacia, as you may think it is a kind of acacia. The leaves have the appearance of feathers and the white flowers are like the laburnum's - called silver chains.



The locust tree is a very hardy tree and grows in all parts of the United States. It is a very useful tree for timber and for fuel. The wood is very hard and strong and is used for many purposes. The tree is also very beautiful and is often planted in parks and gardens.

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# THE GREEN PYRAMID OF THE MOUNTAINS

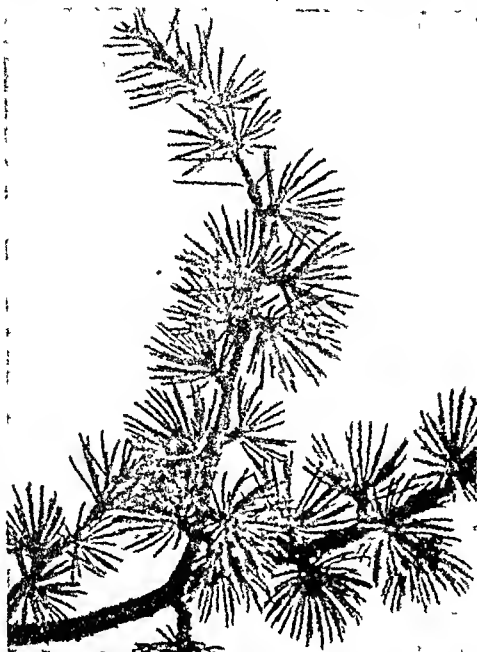
The "rozy plumulets" of the larch, as Tennyson calls the flowers, vary in colour from pink to purple, though they are usually of a reddish purple hue. The leaves grow in tufts, but unlike all other trees that bear cones, the larch loses its leaves in winter.



The larch is the tree of the mountains, and in the Alps forests of larch grow 6,000 feet above the sea. A Duke of Atholl, who made experiments in larch growing, planted 27,000,000 larch-trees in Scotland. The tree becomes a fine green pyramid a hundred feet high, and the wood, being very durable, is used for telegraph poles.



# THE CEDAR, "THE GLORY OF LEBANON"



The needle-like leaves of the cedar grow in tufts like those of the larch, and they remain upon the tree for four or five years. These leaves are about an inch in length.



The flowers grow at the ends of short branchlets, and the brown cones that result are shaped like a plum. They remain on the tree for several years before falling.



All kinds of superstitions have grown up round the cedar, "the glory of Lebanon," as Isaiah calls it. One is that the Cross was made of cedar wood, but there is no evidence of this. The name cedar means "power," and refers to the strength of the wood, but in Britain cedars do not produce good timber, being grown for ornament.

THE NEXT PICTURES OF FAMILIAR THINGS ARE ON PAGE 3765



## JOHN MAYNARD, PILOT

In thick darkness the great steamer was creeping through dangerous but smooth waters toward the end of her journey. The passengers and most of the crew were asleep in their berths. The captain was taking his well-earned rest in his cabin. On the bridge was the pilot, a man named John Maynard who had left his wife and three children behind him. He loved much better than his own life to land this great ship safely into harbor.

It was one of those dark nights at sea when it is impossible to catch a glimpse of the vast ocean through which ships make their way. No stars shone in the sky. The little lights of the harbor were hidden by the darkness of the night. The only light was the dark, narrow strip of the harbor lights.

Suddenly a great light was seen. It was a fire, bright and hot. It was a fire, bright and hot. It was a fire, bright and hot.

But the fire was not a fire. It was a fire, bright and hot. It was a fire, bright and hot. It was a fire, bright and hot.

sparks to the sky. The captain did not in a minute more we shall have reached land. Our lives may yet be saved. It is not too late. It is not too late. It is not too late.

John Maynard was the pilot. He turned at night and all of John Maynard are the pilot. A great light was seen. It was a fire, bright and hot. It was a fire, bright and hot. It was a fire, bright and hot.

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But, just as they abandoned hope, the answer came—so slow, so choked, so difficult, that it was hard to believe that the same man spoke.

"Sir, I'll try," said John Maynard

The thoughts of the passengers, at that instant, were turned from the faithful pilot. The lights on land suddenly stood out before them in the distance. A loud cheer ascended from the decks. They were saved. The race against fire had been won. Land was near, houses were visible; the towers of churches, the names of shops, and the lamps in the street came into view. Boats could be seen putting out to them.

John Maynard, from the bridge, could see mothers clutching their children to their hearts. His own little son, his well-

beloved, was asleep at home, far away. The moving mass of roaring flame, which once had been a ship, reached the harbour.

Passengers threw themselves into the waiting boats. Not a thought was given to the pilot. On the sides of the harbour was gathered a dense multitude, watching the spectacle of a great ship on fire.

When everyone was saved, the boiler exploded with a deafening roar, and John Maynard was hurled into eternity.

Many men who stood on that flaming deck remembered to their dying day, as the most vivid impression of their life, the look on John Maynard's face as he held to his post in the blinding smoke and the fiercely raging fire.

## A POACHER'S SILENCE

SOME thirty years ago a gamekeeper was killed in the East of England, and two poachers were arrested for the crime and brought to trial. There was no difficulty as to which of the poachers was the guilty party. One of the men confessed that he and he alone had done the horrible deed. But for some reason or another there was a general feeling that he was innocent, and the trial excited very great interest. When the verdict was given, and the judge had pronounced sentence of death, the friends of the prisoner bestirred themselves, and, raising the plea that he suffered from a deformity of the neck which would make it a torture to hang him, they succeeded in getting a respite.

But, after the respite had been granted, the law ordered a medical examination of the prisoner, and none of the doctors could find any reason why he should not meet the punishment for his crime. He was, therefore, for the second time condemned to death. But the people in his part of the world were utterly unconvinced that he was guilty, and immediately set about getting up fresh petitions for his reprieve. So numerous and so earnest were these petitions that the law again granted a respite, and the poacher was sentenced to penal servitude for life.

Think what those words mean—"penal servitude for life." They mean that a man ceases to be a man, and becomes a

number, that every to-morrow is the same soul-killing monotony as yesterday; that no friend may come near him, and that the life of the world is shut out from him by frowning walls.

Perhaps this poacher many times wished that the law had put him to death, for he lay in prison day after day, week after week, month after month, for nearly thirty years. Then he was released. He went into prison a strong and vigorous man, with dark hair, bright eyes, and ruddy skin, he came out white and bowed, and marked for ever with the grey pallor of the prison cell.

And when he came out and found that his fellow-poacher was dead, he told the story of his crime. It was not he, but his fellow-poacher, who had killed the keeper—struck him down with the butt of the gun, and thrown the body into a pond. He himself had had no hand in the crime. But why did he take upon himself the guilt? Why did he twice hear himself condemned to be hanged, and then for nearly thirty years of awful torture hold his peace? The answer shows us that even in bad men there is a soul of goodness. This rough English poacher held his peace because the real murderer was a married man with a wife and children dependent upon him for support. He himself was unmarried. And so, for the other man's wife and children, this simple, rough-hearted poacher did what he could, and offered his life.

The next Golden Deeds are on page 3789.

## The Child's Story of FAMOUS BOOKS

THE STORIES OF CHARLES KINGSLEY

CHARLES KINGSLEY wrote *Westward Ho!* mainly as he says himself to commemorate those early days of England's naval and commercial glory when under the wise rule of Queen Elizabeth, England's enterprise was spreading and taking root in distant seas and distant lands. Spain was the most powerful of European nations at that period and her ambition was to be mistress of the world especially of England. But England's seamen, chiefly the men of Devon, put an end for all time to such designs when they routed the great Armada in 1588. Kingsley was himself a Devon man so it was natural that he should make his hero a Devonian. His story of Devonshire worthies and their Spanish foemen is as lifelike as anything in the whole range of historical fiction—hearty English, Protestant, free, strong and tender. It reveals in a peculiar way the English Protestant hatred of the Spaniards, but here the story is the thing.

## WESTWARD HO!

THE hero of our tale is a certain Devonshire youth named Amvas Leigh. We meet him first in his native Budeford that little white town standing so pleasantly among the beautiful scenery of North Devon beneath its soft Italian sky fanned day and night by the fresh ocean breeze. In the days of our story Budeford was one of the chief ports of England. It furnished seven ships to fight the Armada and even more than a century afterward as the old historians tell us it sent more vessels to the northern trade than any port in England save London and Tyndrum.

[illegible]

Well Amvas Leigh being a B. def. to  
saw a lot of sailors  
and ships and being fond  
of adventure he tried to go  
to sea. He wanted especially to  
see the Indies and to fight the  
Spaniards. He said so to a group  
of weather beaten mariners whom he  
came across one fine summer after-  
noon in the year 1525.

[illegible]

Myself had a long stay at  
garden & will be in the  
own along Cay, as Jerry there in  
the local water in the stone  
may even be up to level of  
propagated by the water  
much nearer to the West end  
by the river & about 10 miles  
longer up the river than  
I have been able to go  
to - but I am not sure if it



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is a certain Devon  
shire youth named  
Amias Leigh. We meet  
him first in his native Bideford  
that little white town standing so  
pleasantly among the beautiful  
scenery of North Devon beneath  
its soft Italian sky fanned day and  
night by the fresh ocean breeze. In  
the days of our story Bideford was  
one of the chief ports of England. It  
furnished seven ships to fight the  
Armada and even more than a  
century afterward as the old his-  
tories tell us it sent more vessels  
to the northern trade than any port  
in England saving London and  
Totham.

[illegible]

Will Amvas Leitch, being a 16' old boy, saw a lot of sails and ships and long find of adventure. He longed to go to sea. He waited especially to see the Indies and to hit the Spaniards. He joined a group of weather beaten mariners whom I came across one fine summer afternoon in the year 1573.

He was just fifteen then but for some time past on account of his extraordinary size and strength he had been the undisputed cock of the school and the most terrible fighter among the British lads. He was the terror of all the ladies and the pride and stay of all the town's boys and girls and hardly a student that he did not have his share of blows without hearing a big fellow like him, a little one, say that he had a right to his boy and prize his father and mother who were of gentle blood at the saying was and going to war when he was a young man.

[illegible]

Grenville was there too—that same hero who fought the Revenge against such terrible odds, as we know from all the naval histories, and from Tennyson's stirring poem on the subject

#### OUR HERO GOES TO SCHOOL WITH A PROMISE OF ADVENTURE

The Leighs were naturally opposed to their boy going to sea so early, especially as his elder brother, Frank, was already far away in a foreign land. They made their appeal to Sir Richard, who himself talked to the boy.

"Come now," he said to Amyas "I will make you a promise. If you bide quietly at home and learn from your father and your mother all which befits a gentleman and a Christian, as well as a seaman, the day shall come when you will sail with Richard Grenville himself, or with better men than he, on a nobler errand than gold-hunting on the Spanish Main."

And thus Amyas Leigh, cheered by the prospect here held out to him, went back to school, while Mr. Oxenham proceeded to Plymouth without him, and so off to the boundless West, never more to be heard of, as it turned out.

But one never knows what a restless, adventurous youth with the sea-call in his ears will do. Amyas Leigh did not remain long at school. One day the master, Sir Vindex Brimblecombe, having reprimanded him, received from the pupil a smacking blow with a slate on his bald head. When Vindex recovered sufficiently, Amyas had to be switched. Amyas did not like it, so he went straight away to Sir Richard Grenville to take counsel with him about the sea project. Amyas had lost his father by this time, and Grenville had, in a manner, taken the father's place.

#### AMYAS SETS OUT FOR THE SPANISH MAIN UNDER SIR FRANCIS DRAKE

It was quite clear to Sir Richard that nothing was to be done now but let Amyas have his way. So Amyas presently found himself riding joyfully towards Plymouth by the side of Sir Richard, and being handed over to the famous Captain Drake, whose name was already, by reason of his pirate adventures, the terror of the Spanish Indies.

Three years passed, during which Amyas Leigh was not seen in his native Bideford. He had been round the world with Drake—literally round the

world. In those days that was an achievement something like what we would regard the finding of the North Pole now. So when Amyas and the other Devon men who had been with him returned in safety, Bideford held a public thanksgiving, made a holiday for the occasion, and had its streets turned into a very flower garden of all the colours, swarming with seamen and burghers and burghers' wives and daughters, all in their holiday attire. That was how Amyas Leigh came home the first time. As they saw him in the church, he was still a beardless boy, yet with the frame and stature of a Hercules, like Saul of old, a head and shoulders above all the congregation, with his golden locks flowing down over his shoulders. He would have good use for that strength and that figure by-and-by, as we shall see.

#### HOME AGAIN FROM HIS FIRST VOYAGE OF ADVENTURE, AMYAS FALLS IN LOVE

Meanwhile, he had fallen in love. The lady was Rose Salterne, the Mayor of Bideford's daughter, a beautiful girl of eighteen, about whom the half of North Devon had gone crazy. Amyas had a rival in his brother Frank, now at home, a tall, slim fellow of twenty-five. And he had a rival, too, in his cousin Eustace, a religiously inclined person, who had been Papist and Protestant in turn, like the Vicar of Bray celebrated in song, but who now, in the reign of Protestant Elizabeth, was finally settled in the older faith. Eustace got the length of proposing to Rose, but Rose rejected him. She was a thorough specimen of a West-country maiden, full of passionate, impulsive affections, and wild, dreamy imaginations—a fit subject for all romantic and gentle superstitions. She had no wish to break hearts, but her admirers were all very charming, and no one of them was very much better than the others. So she kept them all dangling, as it were, and Amyas Leigh had no more favour with her than the rest, notwithstanding that he was so madly in love.

But, in truth, Amyas had more serious work on hand than love-making, as we shall see presently. Just now he had to help, with Sir Richard Grenville, in the capture of some intriguing Jesuits. And then came an entrancing experience when, in Grenville's presence,

## BACK FROM THE SOUTHERN SEAS



The following information was obtained from the records of the Department of the Interior, Bureau of Land Management, and the Bureau of Reclamation, and is being furnished to you for your information.

he listened eagerly to "the true and tragical story of Mr John Oxenham," as told by Salvation Yeo. Salvation Yeo makes a great figure in our tale. He was a tall, gaunt fellow, with a florid, black-bearded face. Amyas had encountered him long ago among that group of sailors on Bideford Quay. He was then dressed in a suit of crimson velvet. By his side were a long Spanish rapier and a brace of daggers. His fingers sparkled with rings, and he had two or three gold chains about his neck, and large ear-rings in his ears. A man, once seen, to be remembered for ever.

Like Drake, Salvation Yeo was full of the conviction that, in fighting the Spaniards, he was fighting for the cause of freedom, of England and of God. And, as we shall not mention him again, let us take it for granted that, when he goes out adventuring with Amyas, as he does he takes a big share in the fighting and goes through with it in his own sturdy, rough, masterful way.

#### THE STIRRING STORY TOLD BY SALVATION YEO

And what a story that was he told to Grenville and Amyas! It was all about Oxenham's adventure and his tragic end—for Yeo had gone as gunner on that same expedition in which our young hero had so wished to have a part. Yeo had helped to get the crew of seventy men together. And now, clasping his hands on his breast, he exclaimed to Grenville: "Those seventy men, sir—seventy gallant men, sir, with every one of them an immortal soul within him—where are they now? Gone, like the spray! And their blood is upon my head!" Oxenham had called his men together one day. "I tell you now," he said, "what I forbore to tell you at first, that the South Seas have been my mark ever since I left Plymouth. Such news have I of plate-ships and gold-ships, and what not, all which, with the pearls of the Gulf of Panama, and other wealth unspeakable, will be ours if we have but true English hearts within us." At which, as Yeo confessed, the crew "were like madmen for lust of that gold, and cheerfully undertook a toil incredible." Alas! the Spaniards proved too much even for the brave English hearts. In that exciting hunt for gold and treasure, many of Oxenham's men were slain

some died of hunger and some of disease. Oxenham himself and sundry more were hanged, while Salvation Yeo fell into the cruel clutches of the Spanish Inquisition to escape by-and-by, and tell that wonderful yarn, which would make a good long story by itself.

#### AMYAS LEIGH CAPTURES AN IMPORTANT PRISONER, DON GUZMAN

And now we must return to our hero proper. Sailing the Southern Seas was what Amyas Leigh preferred, but if that could not be done he would go fighting nearer home. It was now the year 1580, and the hated Spaniards were menacing Ireland. England had a Protestant sovereign, and the Spaniard wanted to claim Catholic Ireland as the Pope's gift to himself. His plea was that Elizabeth had forfeited her title to Ireland by heresy. Ireland has long had two great struggles, the religious struggle and the land struggle, and just now it was the religious struggle that was distressing that country.

But the Spaniard could not hold his own on British ground against the men of Devon, of whom our Amyas was one. At the end of a severe encounter, Amyas brought in a captive. "He and I," he told his superior, "cut at each other twice or thrice, and then lost each other, and after that I came upon him among the sandhills trying to rally his men. But his men ran, so I brought him in."

Though Amyas did not know it, the prisoner was to play a very important part in his story. His name was Don Guzman. He was a very tall and graceful personage, golden-haired and faulskinned, with hands as small and white as a woman's. The Don was Amyas's prize by right of war, but where to bestow him was the question.

#### AMYAS TIRES OF HIS LIFE IN IRELAND AND THIRSTS FOR NEW ADVENTURES

In the end, Sir Richard Grenville, having been communicated with on the matter, agreed to receive the Don as his own guest at Bideford till his ransom should arrive.

Meanwhile, Amyas, now a lieutenant, was left alone among the Irish bogs for two more years. Then, getting utterly sick of Ireland and the inactive life, he came home, determined on some adventure Westward Ho! As it happened, Sir Humphrey Gilbert, most pious and most learned of seamen and of cavaliers,



British fashion, won their markets bravely at the point of their swords. For the Rose, also, there was fighting to do. The first of it came when she touched at Margarita, the Isle of Pearls, then famous in all the cities of the Mediterranean and at the great German fairs. Lying in the roadstead was a Spanish man-of-war, as we would say, and three boats by her

#### OUR HERO'S EXPEDITION WREST THEIR PRIZE FROM THE SPANIARDS

Now, it was a recognised law in those days that wherever British seamen found a Spaniard, they should fight him. So Amyas and his men went for the enemy, and in brave style. They scrambled up his sides, and the crew yielded at once, some falling on their knees, some leaping overboard, and the prize was taken. It was the first prize of the expedition, but it was a notable one, for ship and boats were full of goodly pearls which would bring a long figure in dear old England.

The men would gladly have hawked awhile round Margarita and Cubagua for another pearl prize. But Amyas, having, as he phrased it, "fleshed his dogs," was loth to hang about the islands any longer. Rose Salterne was ever in his mind, and he must now make straight for La Guayra. Soon they came within sight of the mighty range of the Caraccas Mountains, and one day more brought them to the port of La Guayra. Four thousand miles of sea had been crossed, and now they were at their destination.

#### AMYAS IS ON THE HEELS OF DON GUZMAN AT LAST

Just before reaching it, they had encountered an Indian in a boat, who warned them to avoid La Guayra altogether. "There are ships of war there waiting for you," said he, "and, moreover, the governor, Don Guzman, sailed to the eastward only yesterday to look for you!" Guzman? Ah, then he *was* really here! It was something to know so much. As for the ships of war, Amyas and his men would risk them. However, they found it a ticklish business. There, in the open roadstead, lay tossing at anchor five Spanish vessels, ugly looking craft, at sight of which even the brave British hearts quailed. It was clearly impossible to surprise the town which

held the governor's house while these ships were there. The leaders of the expedition looked at each other with anxious, inquiring faces. What was to be done? Were the plans and hopes of months to be brought to nought in an hour? A council of war was held, and behold, while they talked, the sun plunged into the sea, and all was dark. And with the dark came a decision.

It was Frank Leigh who made it. He had identified the governor's house, and he declared that he would himself go off in a boat, proceed to the house, and have audience of Rose Salterne, of whose presence there he had no doubt. Protests were, of course, made against his going alone, and they drew lots to fix his companion. The lot fell upon Amyas. So the two brothers went off with a small picked crew, well armed. Reaching the pebble beach, the men were left with the boat, and the brothers started for the governor's house, with their swords only. They reached the house all right.

#### HOW AMYAS TRIED TO SAVE HIS BROTHER'S LIFE AND NEARLY LOST HIS OWN

But what did they find there? They found twenty negroes lying around the terrace in front. At present, they were a sleeping guard, no doubt; but the slightest noise would waken them. One, in fact, wakened suddenly, and uttered a cry. Amyas dragged Frank down into the bushes, whispering, "Let us go back. We cannot go up without detection. Come back, for God's sake, ere all is lost." Just then, round the corner of the house a dark-cloaked figure stole gently, turning a look now and then upon the negroes, and came right towards them. It was Rose Salterne—no doubt about it. But what was that behind her? Another figure. Obviously it could not be Don Guzman, who was at sea. "It is Eustace, our cousin," exclaimed Amyas. "How came he here?" And Eustace it was Eustace, remember, had been one of the rivals for Rose's hand, and he was, moreover, anxious to make her a convert to the Roman Catholic faith.

The brothers felt as if they should run their swords through him for this deception. They started up, and, in face of all danger, confronted the pair. Frank immediately made a wild appeal to Rose, who answered that she could

## A STORY OF THE SPANISH MAIN



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mother They went out a hundred, and they came back forty-four Where were the rest?

Their bones are scattered far and wide  
By mount, and stream and sea

And what of Rose Salterne, she for whom this great adventure had been undertaken? Bunt, alas! at the stake as a heretic, for she declined to give up her Protestant faith That was the way the Spaniard dealt with "heretics" in those bad old days of religious bitterness

#### THE TRAGIC FATE OF ROSE SALTERNE AND FRANK LEIGH

The very morning after that terrible night's encounter at La Gmalya, Rose was seized and taken down to the quay, and shipped off to Cartagena She was asked to recant and become a Romanist but she remained firm. Three weeks afterwards, she was brought out to her fate And with her, in the ghastly procession, walked Frank Leigh, who had recovered from his wounds only to die by the fires of the Inquisition These two, who had loved and lost, walked together now, and were burnt at one stake "They were both very bold and steadfast," said an eye-witness, "and held each other's hand to the very last"

When Amyas Leigh heard all the dreadful story, he vowed another oath, and it was this that he would kill Spaniards, in fair fight, by land and sea, wherever he met them The day was close at hand when Amyas could fight the Spaniards at home For this was the year of the great Armada—that same 1588 which decided, once and for all, the fortunes of the European nations, and of the continent of America

#### AMYAS IS CHEERED AT THE PROSPECT OF ENGAGING DON GUZMAN AFTER ALL

We all know the story of the twelve days' fight which closed with the complete rout of that vast armament which Philip II. sent over to subdue us All that concerns us about it here is the part played by our hero Above and beyond his delight at fighting the Spaniards, he had the hope of encountering Don Guzman, his old rival But it took him some time to find the St Catherine, Don Guzman's ship, among all that array of craft Day after day, in the protracted tussle, he sought for his prey At last his quest was successful

'Don Guzman!' he shouted, as he brought his own ship up against the Spaniard "At your service, sir, whatsoever you may be," was the reply. A dozen muskets and arrows are levelled at the Don, but Amyas frowns them down. "No man strikes him but I Spare him, if you kill every other soul on board Don Guzman! I am Captain Amyas Leigh. I proclaim you a traitor and a ravisher, and challenge you to single combat." "You are welcome to come on board me, sir" answered the Spaniard, "bringing with you this answer, that you lie in your throat" "Coward!" shouts Amyas "Why that name of all others?" demands the Spaniard. "Because we call men cowards in England who leave their wives to be burnt alive by priests"

#### HOW THE SPANIARD MET HIS FATE, BUT ELUDED AMYAS AT THE LAST

The Spaniard started, clutched his sword-hilt and tossed back "For that word, you hang at my yard-arm if Saint Mary gives me grace" Then the fire began from both sides. Amyas poured in his shot till the Spaniard's sides were hit and spotted in a hundred places But the Spaniard seemed invulnerable, and when night came she was still in a condition fit enough to rejoin her fellows It seemed as if Amyas was to lose his prey after all It would not be his fault if he did

The Spaniards had gradually been losing ground, and in another day or two the "invincible" Armada, pommelled and riddled by the English, was seen in ignominious flight northward Some part of the English fleet started after them, but had to give up for want of powder and shot Amyas Leigh alone held on He must have his revenge Sixteen days passed, and still the chase went on Then, just as Amyas was about to close with his enemy, a great storm arose, and the mighty St Catherine, with 500 souls on board, plunged her yards into the foam, and vanished for ever, taking with her the man who had stolen the Rose of Bideford

"Shame!" cried Amyas, hurling his sword far into the sea "Shame" to lose my right, my right, when it was in my very grasp! Unmerciful!"

And that was the end of all Amyas Leigh's exciting adventures

The next Famous Books are on page 380

The Child's Story of  
THE EARTH



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## HOW THINGS ARE MEASURED

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slower in the course of ages, because, as we have learnt, the tides act as a brake upon it. But this is so slight that, for all our purposes, the length of the day is a perfectly fixed and constant thing. We divide this up into twenty-four parts, which we call hours, and these into minutes and seconds. The second, then, is the thing we reckon from, and a second is simply a sixtieth part of a sixtieth part of a twenty-fourth part of the time that the earth takes to spin completely round once.

#### A THING ABOUT WHICH THE WHOLE WORLD AGREES

It is one of the most fortunate of all possible things that the whole civilised world is agreed as to the second. We call it a unit, as if time could be cut up into little pieces, each of which is a *one*, or a *unit* of time. All over the world, then, the unit of time is the same. If anyone proposed that we should have a unit of time rather longer, or shorter, than a second in this country, or that the units should be different in all countries, everyone would be horrified. Once men are agreed upon anything, they can see plainly enough what a lot of unnecessary trouble it causes when they do not agree.

Now, it is a pity that our unit of time is about the only thing we *do* agree upon. Everyone who has begun to think about the subject at all knows that if only we had the sense to agree upon units of weight and space, endless trouble and labour would be saved. First, as to space. If we think of a solid box, we shall understand that it is possible to measure space in three directions, or, in the case of a flat thing like a sheet of paper, we can measure in two directions—though, of course, the third direction really comes in, for the paper has a certain thickness, or, if we can imagine a line that has no width, then there is only one direction in which to measure.

#### HOW A KING'S ARM BECAME A MEASURE FOR A NATION

But, whatever we are measuring, all we need is one, two, or three measurements of distance, and so we want a unit of length, or distance—something to correspond to the second, the unit of time. In this country, as we all know, our unit is the yard, which we divide up into three feet, each divided into twelve inches. The length of the yard is supposed to

have been based upon the length of the arm of one of our early kings. There is really no particular reason why it should be as long as it is, for it is not based upon any natural distance, as the second is based upon a natural period of time, the time of the earth's rotation. Nor is there any reason why the yard should be divided up as it is, and there is still less reason why 1,760 yards should make a mile. To tell the truth, all our English measurements of distance, like our measurements of weight, and our coinage arrangements, are needlessly complicated. They only make endless trouble, which does no good to anybody, and the time will certainly come when they will be all swept away.

The point is this. Because we have ten fingers we count in tens, therefore, for ease and quickness of reckoning, all our measurements should be in tens, then, in order to reckon, we should only have to use the very simple method which we learn when we study decimals.

#### THE MEASURE THAT IS USED ALL OVER THE WORLD

All over the civilised world now, men of science have agreed upon a certain kind of measurement which is not the English measurement at all, and in most countries the scientific way of measuring is also used for ordinary purposes too. English traders are often very seriously at a disadvantage, because they reckon in different terms from the rest of the world, and will not take the trouble to find out how the rest of the world reckons. If foreigners cannot count like us, they must be stupid, we think!

This new and sensible system of reckoning is called the metric system, from the word *metre*, meaning measure, which is its unit of length. We owe the metric system to the French. They wanted to get a natural basis of measurement, and so they measured the distance from the earth's Equator to the Pole, and took a fraction of that, and called it the metre. As a matter of fact, their reckoning was not quite accurate, but that does not matter.

The point is that all the other measurements are based upon the metre in tens. The length of the metre is slightly more than thirty-nine and a third of our inches, so it is rather more than three inches longer than a yard. Then, in order to get fractions of a metre, or

multiples of a metre there are used all over the world, terms derived from Latin. For instance, the tenth part of a metre is called a *decimetre*, the hundredth part is called a *centimetre*, and the thousandth part a *millimetre*.

#### THE WONDERFUL METRIC SYSTEM THAT MAKES RECKONING EASY

This however only begins to express the simplicity of the metric system. The great point about it is that all the other kinds of measurement are calculated from the metre. For instance, our pints and quarts have nothing to do with our yards. But in the metric system all the measurements of bulk are based upon the length of the metre, and then the measurement of weight, or rather of mass, is based upon the weight or mass of a certain bulk, the size of which is derived from the metre. The consequence is that weight and volume and length can all be understood in terms of each other in a moment, and the labour of reckoning becomes practically nothing at all. This is as a Englishman of science were to compare it in terms of usage, the French method to do all his reckoning in inches and grains and pints, and so on, he would get about as much work done in a week as he now does in a day.

A good many sensible people want to adopt the metric system generally in England just as it already is adopted for science everywhere, and in most of the other civilized countries, and a lively to see the change made.

Now we have the unit of time, which is the second, and the unit of length, which is the metre. But many people say there is an other question, how long time and space and so on, is the unit of stuff that things are made of.

#### THE METRIC SYSTEM OF WEIGHTS AND MEASURES THAT WE USE IN PHYSICS

In this country we reckon weight by a unit called a pound. The difference between the metric and the English system is, however, not so great as it seems. For instance, a pound is equal to 16 ounces, and a kilogram is equal to 1000 grams. So if you want to know how many grams are in a pound, you multiply 1000 by 16, and you get 16,000. This is a very convenient number to work with, and it is the same in all countries that use the metric system.

measurements. This then is what we have done. We choose water because it is so familiar and important. Now we know that water is at its densest or most shrunken when its temperature is four degrees above zero, or 32° F., which is called the centigrade scale. So we say that we shall use 1000 parts of mass, the mass of one cubic centimetre of pure water at the temperature 4° C. This unit of mass is known as a gram. It is roughly equal to about fifteen of our grains. Just as in the case of the metre we can divide the gram into tenths and hundredths and thousandths, multiply it in the same way.

The scale of temperature called centigrade—that is, hundred steps—is also based on the unit of mass. On this scale the freezing point of water and too the boiling point of water. This scale is used all over the world, and is the only one that is used in many parts of the world. But in Great Britain we still stick to the Fahrenheit scale, though we have not even the excuse that it is an old invention. On this scale the freezing point of water is 32° and the boiling point is 212°. This is a very inconvenient scale, and it is never used in science. We must adopt a more scientific scale.

We have a definition of the unit of weight, and sometimes a definition of weight is given. It is the weight of a certain mass, and it is the same in all countries. The unit of weight is called a kilogram, and it is equal to 1000 grams. This is a very convenient unit to work with, and it is the same in all countries.

If you want to know how many kilograms are in a pound, you multiply 1000 by 16, and you get 16,000. This is a very convenient number to work with, and it is the same in all countries. The unit of weight is called a kilogram, and it is equal to 1000 grams. This is a very convenient unit to work with, and it is the same in all countries.

put them together, and then they become very interesting. When we reckon time and space together plainly we get the idea of speed—how much time was occupied in covering certain distances. In science it is common to take together the idea of speed and the idea of direction, and the word that is used is *velocity*.

Velocity means more than speed, for when in science we say that a thing has the same velocity, we mean not only that it is moving at the same speed, but also that it is moving in the same direction. Here, however, we need only think of speed, and need not trouble ourselves about velocity. Sometimes in Nature we find that speeds regularly increase or regularly diminish. This happens, for instance, when a body falls under the influence of gravity, or when it is thrown up, and is slowed down, by the influence of gravity.

#### WHY IT IS DANGEROUS TO FALL FROM A GREAT HEIGHT

It has been proved that whenever anything falls to the earth under the influence of gravity, in each second of time it passes through thirty-two more feet of space than it did in the second before. This, of course, explains to us why it is more serious to fall from a great distance than from a small distance. If gravity simply pulled a body at a certain rate which did not change, it would hurt us no more to jump from a high tower than to jump off a chair. But what happens is that the speed of a falling body constantly increases, so that the farther we fall, the greater the force with which we strike the ground.

Of course, when we state this about the speed of motion under gravity, we assume that nothing interferes with the action of gravity. But we know that gravity is not the only force in the world. For instance, let us take the case of a raindrop. Suppose that a raindrop formed in the sky had to drop through empty space to the earth. In the first second it would cover not 32 feet, but 16, because, at starting, its speed would be nothing, and only at the end of the first second would the speed be 32 feet per second. So the distance covered in that first second would be one half of 32 feet, in the second it would cover 48, and so on. If we knew the height from which it began to

fall, we should know its speed when it reached the earth. If, also, we knew its mass, we should know the force it had in it at the end of its journey. But, in point of fact, a drop falls through the ocean of air, which is resisting it all the way, and which, fortunately for us, greatly diminishes its speed.

#### HOW THE AIR PREVENTS THE FALLING RAINDROPS FROM KILLING US

Were it not for this resistance, we do not know what would be the consequences of being struck by a raindrop or a hailstone. Recent work has shown that there is a limited speed which raindrops cannot exceed, because the faster they move the greater is the resistance of the air, and so at last they cease to move any faster. This, of course, would not be the case if gravity were acting without anything to interfere with it. People who study the speed of ships in water know that the same thing applies there, and that the faster the ship moves, the greater is the resistance of the water.

Gravity, as we have said, is not the only force in the world, but it is always acting everywhere upon everything. If, then, we find things at rest, there must be some other forces which are working to oppose the force of gravity. When we think of this, we shall see that we get a new idea of what we mean by rest.

Undoubtedly there is really no such thing as rest. Everything is continually moving, and it is moving under the influence of forces, such as the force of gravity—the table at rest on the floor is moving with the floor and the earth. But still that table is at rest as compared with the earth—relatively to the earth, as we say. And so, while understanding that there is only relative rest, and no real rest anywhere, we must ask ourselves what rest means, and upon what it depends.

#### THE FORCES THAT ARE NEEDED TO KEEP A THING AT REST

It might be thought that when we are studying motion, rest has nothing to do with our subject, because we think of rest as the opposite of motion. Yet that is not true. What we are really studying, whether we are looking at motion, or at rest, is the action of forces. Newton's first law of motion might just as well be called the first law of rest. It applies equally to both states. Whether moving, or at rest, a body is subject to



We can only understand how this happens if we think of the crowbar as a kind of see-saw with a long arm where the man applies his force, and a very short arm on the other side. The same applies to pincers, which have long arms and short arms, as we know, and to nut-crackers, and to a man rowing a boat, and to a host of other things.

We can readily understand that often a moving object or a still one may be acted upon by two or more forces which are not perfectly balanced in opposition to each other. If they were, the moving object would be brought to rest, and the resting object would remain at rest. But if the forces do not exactly balance one another then the thing which is being acted upon must move.

But how will it move, in what direction, and at what rate? Can we possibly predict the course that the body will follow if two or more forces of different strengths are pulling upon it in different directions? The answer is that though this is a very difficult matter, yet the laws of motion are equal to the study of it. Each force has its own value, both as regards its power and its direction, no matter whether there be one other force acting or a million, and if we know the power and the direction of all the forces that are acting, we can say in what direction the body will move and at what speed. In other words, to use the special language of this subject, we can predict its velocity.

#### HOW A PLANET'S MOTION TEACHES MEN THE LAWS OF THE UNIVERSE

This is enormously interesting looked at from that side, but it is still more important when we take the case of a thing which is actually moving—say a planet—and moving in a certain direction at a certain speed. For, by the application of what we know about forces, we can discover what are the forces acting upon the planet, the net result of the whole of which, acting

together, is that it moves as it does. The first law of motion says that a moving thing tends to move in a straight line. Put a stone in a sling and swing it round your head. The stone does not move in a straight line, but in a sort of circle. But cut the sling, or let it go, and the stone flies out. Or take a planet swinging round the sun. The first law of motion says that its tendency is to move in a straight line, but in point of fact it moves in a closed path round the sun like the stone in the sling.

#### WHY THE PLANETS DO NOT FLY OFF INTO SPACE

In both cases the explanation is that there is all the time a pulling force acting and preventing the stone or



The tendency of a moving body is to go on in a straight line, and if the stone in this diagram were loose when it reached B or D it would travel towards C or I. But the string pulls the stone towards A, and this force modifies the other, so that the stone goes in a circle. The stone's tendency to fly in a straight line is called centrifugal, or centre-fleeing force, and the force pulling it towards the centre is centripetal, or centre-seeking force.

the planet from flying off. Certain words are very commonly used to describe this tendency of the stone to fly out, and the tendency of the hand and the sling to hold it in a closed path. These words, which mean centre-fleeing and centre-seeking, are not useful. They date from a time when the laws of motion were not understood. The useful thing is to know what happens when a body, moving in a circular path under the action of two forces, first, the

force of its own motion, and, second, the pulling force from the centre, is allowed to go its own way. The answer is that, when this occurs, it flies out at a tangent to the circle. On this page is a picture which shows a circle and two tangents to it, and if we suppose that the sling is opened when the stone is just at the point where the tangent BC or DE starts from, then the stone will fly out at that tangent.

It is nonsense to call the force which sends the stone flying out a centrifugal force. The stone is not trying to fly from the centre. If it is allowed to move on its own account, it will move in a straight line.

The next part of this is on page 3813

# The Childs Book of NATURE



This is the most of a great reptile that lived on land of prehistoric times. It was found at Cape Colony in South Africa.

## NATURE'S GREAT FAMILY

We come to the last of the great family of the earth.





far back in time, there existed creatures whose descendants became on the one side men and women, on the other side monkeys

The Bible story is true but the Bible does not teach science, and it must be read intelligently in the full light of truth as we know it. When we read that God made the world in six days, we must remember that the word "day" is only man's word. Moses—who wrote one of the Psalms—sang "A thousand years in Thy sight O God, are but as yesterday." What we call days the days in which the world was made, may have been ages too long for the human mind to understand. Man would pass through very many stages before God made him perfect.

All life came from the sea, and the creatures from which God ordained that man should spring shared the common lot of all other creatures. It seems hard to believe that men and women could have descended from a form of animal life which gave us apes and monkeys, but that is not harder to believe than that the lemur and the great gorilla descended from the same parents. Yet such is really the case.

THE SOUL THAT MAKES MAN THE LORD  
OF ALL CREATION

The lemurs were the first of all the monkey tribe. The lemurs are our very distant cousins, and so are the powerful gorillas. The chief difference is that God gave man a soul. He ordained that man, in his final form, should be the lord of creation. Animals have not souls. But at any rate, is a hot man, before he ignites when we see a bad man and a faithful dog, or feel it a shame that the brutal man should have a soul, and that the animal should not.

There is a wide gap between the  
lowest forms of human life and the  
highest forms of social life, but there  
is a wide gap also between the level of  
civilization and the level of responsibility. Let us  
think of the old man who sits at his  
desk in the morning, and reads the papers,  
and writes the letters, and signs the checks,  
and makes the decisions, and gives the orders,  
and controls the fate of thousands of people.  
Let us think of the young man who sits at  
his desk in the evening, and reads the papers,  
and writes the letters, and signs the checks,  
and makes the decisions, and gives the orders,  
and controls the fate of thousands of people.

men really belong to the same race as these horrible creatures? Let us think of Ruskin and the influence he has had upon the English-speaking people; then of the degraded men among whom Livingstone lived, and worked, and died.

THE LOWER MEN, WITH LESS LOVE THAN  
THE HIGHER ANIMALS

They killed and ate one another with as little fuss as we should pluck and eat an apple. If one of them wanted to tie the tail of a gaudy parrot in his hair, the customs of his tribe compelled him first to murder a woman ; if he wanted to wear the skin of a certain animal, he must first murder two or three of the people about him.

The natives of Tierra del Fuego, whom Darwin described, were superior to the animals, for they could light a fire and use tools, but they had not as much love for their families as the apes have for theirs. One of the men was seen to dash a child down upon the rocks and kill it, because it had happened to slip, and let fall some sea-bird's eggs. Even a gorilla loves its little one and will defend and tenderly rear it. But these savages, when winter came, and food was scarce, used to take their old women and kill and eat them. Yet once upon a time these people had been far higher in the scale of human civilisation.

They had wandered down from the mainland of South America, where human society was well advanced. It is worth while to study an instance of this sort, for it shows us another side of the picture at which we have been accustomed to look. We have been in the habit of seeing how man and animals have progressed, but the case enables us to see how, in certain circumstances, man can degenerate. Miserable and evil as they were, these savages were the same in form and soul as the rest of us who are living in these far lands.

HOW NATURE IS EVER IMPROVING  
H HER WONDERS

Nature is the power at work  
everywhere in the formation of the  
world around us. It is the  
only cause of all things. First, it  
created the world from nothing,  
and then it has been working  
ever since to make it better.  
It is the power that makes the  
sun shine, the wind blow, the  
water flow, and the plants grow.  
Without nature, there would be  
no life on earth.



have otherwise to seek in fossil form, the character and nature of the things out of which the higher forms came. For, from the lancelet stage there grew up the real fishes. We see what the first types were like, because the tunicates, the lancelets, the hagfishes and lampreys, which are not fish at all, are with us to-day, to tell the story of life unchanged. True, they live in the waters of the sea, but they have no jaws, no limbs, and no scales.

#### THE FIRST CREATURES TO HAVE BACKBONES AND JAWS

The fishes marked a very important upward stage. They were the first of all animals to develop backbones and proper jaws, that gave them a great advantage over other forms of life, and caused fish to take different characters. Fish took to eating fish. Those fish which had the stoutest armour of tough scales would have the best chance of escaping their enemies, and of getting less protected fish to eat. For a long time the bony fishes, the ganoids, as we call them, flourished exceedingly, with their powerful framework of bone and their heavy armour.

The other fish, the fishes whose framework is mainly composed of cartilage, must have had a bad time of it for a long time with these bony-armoured monsters. But there we get the first lesson in the history of the animal family of the uselessness, in the long run, of special protections of this sort.

Sheer weight and strength of armour never, in the long run, carry any class of animal life to success. In the case of the fishes, it was those with the softer skeletons that triumphed. Of all the multitude of bony fishes that once peopled the seas, only seven different kinds remain alive to-day, while those less specially protected abound in countless varieties. Let us keep this fact in mind for a few moments, to remember it when we come to the higher animals.

#### HOW ANIMALS GREW LUNGS AND LEARNED TO BREATHE

The next stage was for the animals to learn to breathe the air of the atmosphere—a most tremendous stride. They had to develop lungs as well as gills. Gills enabled them to breathe by taking oxygen out of the water that coursed over their gills, their lungs enabled them to poke their noses above the water,

and to drink deep of the air that later on, man himself was to breathe. Man himself, in his early form, was a creature who had gills, to breathe in the water as the fishes breathe. The mud fishes, of which we read on page 2540 are still with us, to show how fishes that have gills may also breathe by the aid of lungs, as human beings breathe.

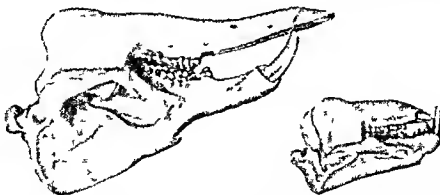
While the fishes were mastering these two sorts of breathing, there grew up, from the tunicate side of the family tree, the first amphibians, the creatures which begin their lives in the water, and end by coming to land. Newts and frogs must have been among the first creatures in all the world that ever set foot on dry land. Of course, newts and frogs did not soon reach the form in which we see them to-day. When we read, as on page 1223, of the various stages through which the frogs and newts pass from their baby days to their grown-up days, we see just the stages which they passed through during ages and ages. They now run through all these changes in the course of a few weeks, but in olden days each stage would last while thousands of generations of frogs and newts lived and died.

#### THE DAYS WHEN THERE WERE GIANTS ON THE EARTH

Then, when the fishes began to breathe the upper air, and amphibians began to disport themselves on land, the animal family underwent great changes. The world came to the age of reptiles. Snakes were created from the lower creatures, and with them appeared the crocodiles and tortoises, and those fearful monsters of which details and pictures are given on page 27. That was indeed an age of giants. We have not time to go again into their history, we may very well turn to page 26 and the pages which follow, and refresh our memories with the stories there set out, and the pictures will help us to fix in our minds the figures of some of the fearful and wonderful creatures which, in those days, became masters of the world before ever man had been created.

We are bound to notice how the way was prepared for these monsters. Insects by this time abounded, and they had taken to leaving the water, in order to escape from the giants which fed upon them in the seas and rivers. The

# HOW THE ELEPHANT GOT HIS TUSKS



At the present time the elephant is found only in the African continent and in the Indian Archipelago. It is the largest of the elephants, and its tusks are the most valuable of its parts. They are used for many purposes, and the ivory is highly prized.



As the age of the elephant increases, the tusk grows longer and thicker. It is a continuous growth, and the tip is always growing. The tusk is made of ivory, which is a form of bone.



This is a diagram of the elephant's head and tusk. It shows the tusk growing from the skull. The tusk is made of ivory, which is a form of bone. The diagram is a side profile of the head, showing the tusk curving upwards and then downwards.

the father of all the apes and monkeys. It is believed that the first of man's family sprang from the stock which gave the world the lemur. We need not go deeply into the question here, it is a matter for later study, but we must not pass away from it without a word in closing our story. The first men were high-shouldered, short-necked, long armed, with slightly bowed legs, hairy, and with big teeth and yellow skin. They were wild and savage as the beasts of the field.

These are deep waters for young people to swim in, and we need not venture farther from the shore. We do not know all these things about the origin of man, we only believe these to be the facts. The real story can never be fully told, until the great day when all secrets are made known to man. We infer these things from similar evidences to those which help us to find out the story of the rest of creation. We do not know how long man has lived on the earth, some say 100,000,000 years, some say 20,000,000 years, some say only 50,000 years.

#### MEN WHO WERE CIVILISED TWENTY THOUSAND YEARS AGO

We know that man has lived very much longer on the earth than the old teachers believed. We may still find printed books giving the date of the beginning of the world as only a little over 4,000 years before the birth of Jesus. Yet in this year, 1909, men have found, in a city long buried, traces of a high civilisation, and a great population, that existed 20,000 years ago.

It is certain that of all the great advances made in the animal world, the advance made by man is the most marvellous of all. Every page in this book tells of the marvels that he has done. The natural thing to believe and hope is that man will continue to improve in the future as he has improved in the past, when, in obedience to the will of his Creator, he emerged from the sea, and, by gradual stages, followed the path set before him, to become the wonderful creature he is to-day.

And so we end as we began, by trying to realise that every form of life in the world is related. We are such stuff as birds, and animals, and reptiles, and trees and flowers are made of. There

are the same elements in the worm as in the rose, in the child as in the tiger. But the mind of a child is something greater than anything the tiger has. It is not the thickness of armour nor the power of weapons that count for all time in the great battle of life.

#### MAN, WHO IS THE MASTER BECAUSE HE USES HIS BRAIN

Man is the weakest, so far as mere strength is concerned, of all the great animals of the earth. An ox could crush him, he would serve only for a single meal to a hungry tiger. But, though he is of the same substance as that of which they are made, he is their master. He has hands to use, and a brain to direct them. He makes tools that are almost as wonderful as his hands that create them. He has always had to use his brain for his living.

The giant reptiles and giant flesh-eating animals did not use their brains as man used his. They developed enormous bodies and amazing armour, but they did not develop their brains. Fearful weapons armed the sabre-toothed tiger, but the tiger that used its brains more and its sabre-teeth less survives to this day, while its more powerful ancestor is numbered with the fossils.

The mighty glyptodon, with its shell like a hut of horn, is part of the solid rock, while the little tortoise still flourishes on a modest diet of lettuce, with a handful of clover flowers as a luxury. The pterodactyle, with its bat-like wings and with claws upon them for climbing, is as dead as the teeth which armed its jaws, but its fairy-like descendants, the humming-birds, sport like magic motion in the tropical forests. The bat flutters light and airy as ever, when the moon peeps out, though most of the companions of its earliest days on earth have died out.

#### THE MANY FORMS OF LIFE THAT ALL SPRANG FROM ONE SOURCE

The hideous ichthyosaurus is turned to stone, but the jolly dolphin sports as merrily in the waves as if his family were new to the delights of the great waters. When we see that all living things sprang, in the first place, from the same source, and that all owe their presence on the earth, or in the waters, to the one universal kind of life, we feel a certain awe in the presence of any form of life.



This picture by the Florence Line is a first for Anglo-American. Peter preaching to the people and Mark writing down his words. It is supposed that Mark learned the facts about the life of Jesus from Peter.

## THE BIRTH OF CHRISTIANITY

THE resurrection was the birth of Christianity. With the death of Jesus may even with His arrest in the Garden of Gethsemane the little flock He had gathered about Him to spread His teaching scattered in fear and panic. The disciples of Jesus all forsook Him and fled. The devout women who loved Him tend the witness of His tragic death from afar. Jesus died in a lonely wilderness.

These followers of Jesus had believed that He would perform some extraordinary miracle and subdue not only Rome but perhaps the whole earth. Perhaps they did not believe in this miraculous triumph with any enthusiasm or with any certainty of its occurrence. But it was a living struggle in their minds. His message under a cross was a terrible loss to their faith. The victory of the persecutors was a terrible blow to their courage. The death of Jesus was the death of their life.

Let us take a moment's view of the state of things. Unless we realize this, all our study of the life of Jesus and the part He played in the world will be a mere study of a dead man.

proof of His resurrection. That proof is the birth of Christianity.

It is impossible for us to think that the panic-stricken disciples after the resurrection would suddenly stand boldly before men and preach the message that had brought Him to the Cross, as they had never hitherto preached it unless they had received some convincing proof that He was more than a man.

Christianity could not have been born in the shadow of the Cross unless Jesus had triumphed over death.

We find these poor frightened disciples trembling and fleeing into hiding places. We find them forming themselves into an assembly or church, giving no rules for the membership of this society and sending out a message of goodwill but no message of power. Jesus, the real living in us, says to them: "I am with you." They are not yet ready to believe that they have received the message of the life of Jesus. They are not yet ready to believe that they are the living in us.

palace was foremost, after the death of that Jesus, in establishing Christianity. In fact, all the disciples, except Judas Iscariot, who had destroyed himself, became after the death of their Master, far more sure of the truth of His teaching, far more courageous in their preaching of it, than they had been during His lifetime. It was not while they half hoped and half believed that Jesus would triumph over His enemies, and reign in glory, that these disciples were earnest and enthusiastic teachers of His Gospel. No, it was after His death, after His defeat, after what they thought to be His failure and their own most bitter disappointment.

#### THE BIRTH OF CHRISTIANITY IN THE SHADOW OF THE CROSS

This birth of Christianity in the shadow of the Cross is the miracle of history. We can understand it only if we accept the written tradition that Jesus appeared to His disciples after death.

And let us think for a moment of His command that they should wait in Jerusalem until they were endued "with power from on high." He had said to them: "My Father is greater than I." He now told them, even in His risen state, that they were to receive power from God. He Himself did not venture to bestow that power. The humility of Christ the fact that this humility is set down by those who were His first worshippers, convinces us how true, how real is the narrative. Nothing in the whole Bible is set down more earnestly than the appearance of Jesus after His death.

#### WHAT THE DISCIPLES BELIEVED ABOUT THE CHARACTER OF JESUS

And now, before we proceed to read the wonderful story of Christianity's first battles with the world—a story which is still the Life of Jesus—let us for a few moments carefully consider what Jesus represented to His disciples, what He meant to them, what they understood Him to be.

Remember that these plain and rustic men, specially chosen by Jesus, lived in days when language was simple. They knew very few of the words which people use now when they quarrel with each other as to what was the exact nature of Jesus. We notice that most of those words are very long,

and that even when their meanings are explained to us, they leave us more or less in darkness. We may learn them by heart. We may recite them. We may say "This is what I believe." But, if we do not understand them, how can we be really sure that we know what we believe concerning Jesus? It is better for us to go back to the disciples, and see what it was that they believed as to the character of their Master.

An English writer has drawn up a number of statements concerning Jesus which are all to be proved out of St Mark's Gospel, the earliest written record, which we will set down here in as simple language as we can. As we grow older, we must read these interesting statements for ourselves in their own language. We shall find them in a book called "Ecce Homo," one of the most beautiful and lasting books ever written concerning Jesus.

#### THINGS THAT THE DISCIPLES KNEW FOR CERTAIN ABOUT THEIR MASTER

Now, these facts are what the disciples knew for certain about Jesus:

1 He assumed a position of authority. Although He was a carpenter, He set Himself above the professional teachers of religion, He made Himself a greater teacher than the doctors of divinity.

2 He claimed again and again that He was the King of whom the prophets had long prophesied. This claim was definite. It was not a figure of speech, such as "I am the vine." He died for the fact of it. He did not die for a metaphor.

3 As the promised King, He claimed some mystic and special dignity for Himself.

4 He would not accept the teaching of the priests. He read and interpreted the Scriptures for Himself. When He was rebuked for not obeying the law of Moses concerning the Sabbath, He replied with a sublime sentence: "The Sabbath was made for man, and not man for the Sabbath."

5 He claimed the power to forgive sins.

6 He called a number of men to attach themselves to His person. He said "Come unto Me." He gave certain plain and simple rules to this society. His name was their bond of union. He made it clear to them that this society would continue after His death. He





The love of men for a Man is something rare, wonderful, almost divine

Now we may go on with the narrative of Christ's life upon earth after His death and after His resurrection

The disciples assured now that He was indeed the promised Christ began to preach His Gospel They had no time then to write down their stories about Him, their reminiscences of Christ, and, unfortunately, they laboured under one terrible and disastrous misapprehension In one thing they had not realised the truth of what Christ told them They believed that He would come speedily to earth again, and set up His eternal throne

#### THE EXPECTANT DISCIPLES, WHO THOUGHT THAT JESUS WOULD QUICKLY RETURN

This mistake on the part of the disciples is responsible for the lateness of the written Gospels, they felt that there was no need to write, because, before that generation had passed away, Christ would come again They had little enough time to preach and convert the world

But this mistake, which we must ever deplore, was perhaps responsible for the magnificent courage with which those men—that little band of humble, simple provincials—created the Christian religion in the shadow of the Cross They knew no fear Nothing that the world could do frightened their souls Everything appeared paltry, except Christ

The boast of Rome, the power of the Jewish priests, the activity of commerce, the enthusiasm of art, the gossip and tattle of the streets—these things were as dust to them They had seen and spoken with a Man risen from the dead A risen Spirit had assured them that prophecy was at last fulfilled The end of the world had come upon them Christ was risen from the dead The King had come Soon, very soon, the power of God would be made manifest to all nations and to all peoples, throughout the whole world

#### THE NEW THING THAT WAS BORN INTO THE WORLD

Is it not interesting that these faithful and devout disciples misinterpreted their Master precisely as the priests misinterpreted the prophets? The priests expected the promised Christ to be a conquering and a reigning King. The disciples expected their Master to

establish an immediate dominion over all the earth They had forgotten Christ's repeated lesson that the Kingdom of Heaven was of slow growth They had forgotten the parable of the mustard-seed

So our first view of Christianity is the spectacle of these earnest and loving disciples preaching Christ's Gospel with the assurance that the end of the world had come.

On the day of Pentecost they were all assembled together in one house, when they were conscious of a cold wind in their midst, and they saw what looked to them like a dazzle of flame on the heads of each other This experience transformed the disciples into the burning and eager missionaries of whom we have spoken So enthusiastic were they, so carried away by the force and reality of their experience, that even devout men in Jerusalem took them to be drunken But when they performed acts of healing, when they preached with extraordinary power of conviction, when they stood up boldly before priests and governors, then the inhabitants of Jerusalem perceived that a new thing had been born into the world.

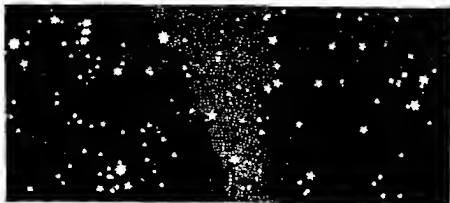
#### THE MULTITUDES THAT FLOCKED TO HEAR THE PREACHERS

The multitudes listened to the apostles—the disciples of Jesus. The apostles did wonderful works of healing They spoke like inspired men Vast crowds flocked to hear them, many sought entrance into the assembly. They became a power

Then came persecution The authorities rose up to stop this heresy Many of the apostles suffered To the despair of many faithful Christians who were eagerly looking for Him, Christ did not come

Of how the religion of Jesus was spread by a remarkable man who, at this time, was persecuting the apostles, we read in another chapter For the present, our narrative is interrupted to tell the story of the writings called Gospels We have hitherto followed the narrative of that Gospel called St Mark We must now turn to the story of how this Gospel came to be written, and how the other three Gospels—those of St Matthew, St Luke, and St John, also came to be written.

The next Bible Story is on page 311.



## DO THE STARS FALL DOWN?

THE things that fall and are called falling stars are really not stars at all. If a real star fell into the earth—or rather if the earth fell into a star—we should all be burnt up by the heat long before the earth and the star could meet each other. The things that fall are really quite small stones or pebbles or balls of iron and other element. They sometimes fall all the way to the earth and can be picked up afterwards. By far the greatest number of them I have never reach the surface of the earth as stones or meteors at all, but they are burnt up or broken up into dust by the earth's atmosphere as they very gradually descend. The dust is especially at the higher levels of the atmosphere is called by men of science.

We see only a few of the falling stars that we call by the earth's atmosphere. For most of the night they are falling all the time, but we never see them. They fall in the dust. They are also a small part of the earth's atmosphere. They are also a small part of the earth's atmosphere. They are also a small part of the earth's atmosphere.



matter can be destroyed and made into nothing, quite a lot of the present

matter of the earth has been derived from meteoric dust falling in this way. The dust of them can sometimes be found lying on the tops of

the highest mountains where no other source of dust such as smoke is at work to produce it.

WHY DOES LIGHT TRAVEL QUICKER THAN SOUND?

We might reply by asking, Why should light and sound travel at the same rate? or Why should light travel slower than sound? If light and sound were waves of the same kind travelling in the same way, then it would certainly appear as if they should travel at the same rate, and we should want to know why they do not.

But light and sound are waves entirely different from each other. Light waves travel in straight lines, while sound waves travel in curves. Light waves are also much faster than sound waves. Light waves are also much faster than sound waves. Light waves are also much faster than sound waves.

imagine The ether is intensely elastic and so carries light through it faster than any waves can travel through ordinary matter No difference in temperature seems to have any effect on the properties of the ether, and so light always travels through it, so far as we know, at exactly the same pace, no matter what the kind of light is—red, or green, or blue So, also, every kind of ether-wave light, radiant heat, or electricity, travels through the ether at exactly the same rate of speed

**HOW CAN WE SEE SUNLIGHT WHEN THERE IS NO AIR TO CARRY THE LIGHT-WAVES?**

The reason is that the waves of light, though they are carried through the air, are not carried by it Waves of light are waves in the ether, which is everywhere whether there is air or not Air carries waves of sound, which are usually waves of air, though they may be waves of other things besides air But waves of light are always waves of ether, and nothing else Air and other forms of matter, whether gaseous, like air, or liquid, like water, or solid, like glass, can have light-waves passing through them, because the ether is everywhere—even in glass or anything else—and it is the ether, whether air, or water, or glass, be there, too, that carries the light Ordinary matter, such as that of air or water or glass, only interferes with the passage of light—perhaps reflects it or absorbs it The real question that might be asked is rather different, then, from this question It should be How can we see the light of the sun, if the air gets in the way of the waves of light in the ether?

**WHAT MAKES AN ELECTRIC LAMP GLOW?**

The electric light is quite different from the light of a fire, or a lamp, or a gas-jet, because it is not made by anything burning So electric light does not use up the air of a room When we turn it on, we simply allow the current, that has been made somewhere else, to run through the lamp When the switch is off, the current does not run through the lamp, for there is a space, or break, between the metal wires that carry it. When we turn the switch on, we make the connection between the wire in the wall and the wire that runs to the lamp If someone takes off the cover of the switch for us, we can see this When

the current runs through the lamp it meets with a certain amount of resistance from the wire, or thread, in the lamp The thread is very thin, and the electric current, in forcing its way through, makes the thread so hot that it glows, and that gives the light We know that we cannot get something out of nothing, and what happens here is, that part of the electricity is changed into the heat that makes the thread inside the lamp glow. The greater the flow of electricity, the hotter and brighter the thread gets, and the more electricity is used up If there were air inside the lamp, the thread would burn away in a moment; but the lamps are so made that there is almost no air at all inside them If we break the glass of the lamp, and admit the air, the thread will burn and snap in a moment when we turn the current on

**WHAT IS THE FORCE IN LIGHTNING THAT KILLS A MAN SO QUICKLY?**

We use the word lightning to mean two distinct things—first, the light that is seen when electricity passes strongly from a cloud to the earth, and, secondly, the electricity which causes that light The light itself is quite harmless It may be seen at a great distance from the place where the lightning really passed, but whether it is seen from afar, or close at hand in a blinding flash, it cannot hurt anyone

But the electricity itself is very different If this strikes the ground close beside a man, it will do him no harm, but, if it actually passes to the earth through his body, it may kill him It does this very suddenly, as a rule, by affecting the brain and the nerves that run from it to the heart As we know, two of these nerves, one on each side of the body, are capable of stopping the heart altogether, if they act powerfully The electricity, in passing, stimulates, or excites, those nerves, so that they stop the heart, and the person dies from shock

**WHERE DOES LIGHTNING GO WHEN IT REACHES THE GROUND?**

The lightning is the light caused by the passage of an electric current, or electric discharge, as we say It is only a momentary consequence of the passage of the electricity, and, when the electricity has passed, the lightning-flash ceases, for there is nothing to make it flash any more It is not the



day. The less distance of air the heat passes through, the more we feel it. Then, again, if a warm wind is blowing past us, the day will be hotter than if a cold wind is blowing. That is to say, the heat of the day largely depends upon the wind, as well as upon the strength of the sun. Lastly, if the air contains a great deal of water-vapour, it can take up so much less from our bodies, and our perspiration does not evaporate, which means, form into water-vapour.

It is this evaporation of the perspiration from our skin that plays the chief part in keeping our bodies cool, though we are always making more heat as we live. If the evaporation of the sweat is made slow by the fact that the air already holds nearly all the water-vapour that it can hold, we get warm, and say that the day is hot. It may not really be any hotter than another day which feels far cooler, but we judge by our feelings, and they are largely determined by the freedom, or the difficulty, with which we dispose of the water that is continually poured out by our skin and from our lungs.

IF THE MOON HAS NO AIR, WHERE HAS ITS ATMOSPHERE GONE?

In this very interesting question we assume that the moon once had an atmosphere. But, plainly, we have no right to assume this. We must first try to find out whether it did have an atmosphere, and then we can try to discover where the atmosphere has gone. Astronomers believe that we are right in assuming that the moon once had an atmosphere, or coating of gas, as the earth possesses. There is even some evidence to suggest that, probably, there are a few remnants of the moon's atmosphere left in its deepest valleys, and this would help to account for the slow and small, but certain, changes that still go on upon the moon's surface, just as the earth's atmosphere helps to account for the many changes that occur on its surface.

An atmosphere is a gaseous envelope, and, in the study of the way in which worlds are made, we are sure that the production of such envelopes at an early stage must be the rule. And, to take an instance, we know that Mars has an atmosphere. But astronomers would even then hesitate to say that the moon once had an atmosphere, if they were at a loss to explain where it

can have gone. Fortunately, we can explain this. When we study the movements of the atoms and molecules of gases, we learn that they must rush away from a planet, or a moon, unless it is so large that its gravitation can hold them to it. The earth's gravitation holds the air to it. Mars is smaller, and so cannot hold to it such a dense atmosphere as the earth, the moon is very small, and can hardly hold any atmosphere to it at all. All the tiny atoms of gas have flown off into space, but no one knows exactly where.

WHY DOES THE MOON NOT SHINE BY DAY?

The moon and the stars *do* shine by day, though we cannot often see them! And the sun shines by night, only we cannot see it. We are unable to see the sun shining at night, because we are on the opposite side of the earth to it. We cannot see the moon or stars shining by day, because the sun is so bright that the stars are *put out* altogether, unless the sun is eclipsed, when they are seen to shine, but it is not so bright as to prevent us from seeing the moon altogether. Of course, there are times in the month when the moon rises at sunset but when the moon rises in the daytime it can often be seen, and, if it is seen, it is shining, though apparently it is not shining so brightly as it does in the darkness of night.

WHY DOES THE MOON GROW BRIGHTER AS THE SUN SETS?

If we watch the moon as the sun begins to set, we shall see it grow brighter and brighter, until, when the night has come, it is quite bright. Of course, it has really been shining just the same all the time, but the sun is sending so much light to our eyes, both directly and reflected from the air, that the light of the moon seems pale, and not worth calling even *moonshine*.

It is the same with all our opinions and feelings. One person in a room may shine so brightly by his talk that other people do not seem to shine at all, but when he goes we notice that they are shining, too. And, if we have a headache and suddenly knock our shin hard against something, we shall not feel the headache until the stronger pain in our shin has passed away. The sun *puts out* the moon just as it *puts out* the fire, it does not really do so, but it seems to our eyes to do so.



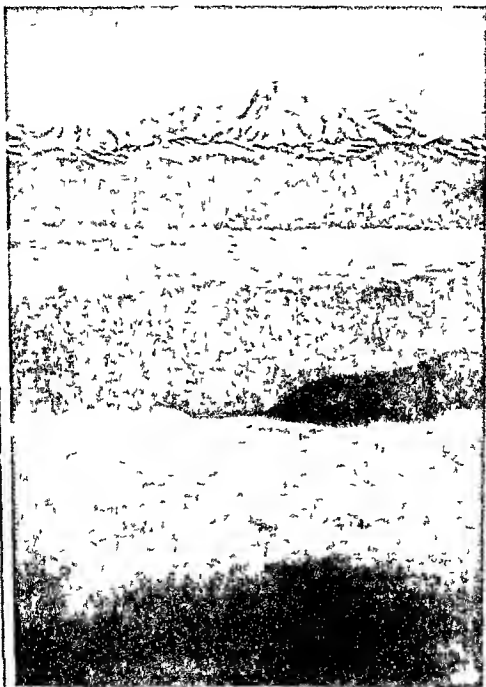
# THE CHANGING BEAUTIES OF THE CLOUDS



We have all noticed the different forms which clouds assume. Sometimes they are very high up, and look like down or delicate feathers, as in our middle picture, when they are called cirrus, which means "a hair". At other times the clouds look like great masses of wool or wadding, as in the bottom picture, and then they are called cumulus, or "woolpack" clouds. Heavy black rain-clouds are known as nimbus, while those that stretch in straight lines across the sky are stratus. We often see clouds that are partly one kind and partly another, and they have such names as cirro-cumulus, cumulo-nimbus. In the top picture we see cumulo-stratus clouds.

The photographs on these pages are by J. Valentine and others.

## A MOUNTAIN TOP ABOVE THE CLOUDS



Yes, I would really think that the country people are the best. You are more the English countryman in the way of his  
nature and spirit. In that sense I am a countryman. But I am not a countryman in the way of his  
country. I am not a countryman in the way of his country. I am not a countryman in the way of his country.



## WHY DO SO MANY PIPES BURST DURING FROSTY WEATHER?

We know already that water has a great peculiarity in the way it behaves when it is cooled. The rule is, that a thing contracts and shrinks as it cools, and if water is cooled down to within a few degrees of its freezing-point, it obeys this rule. But if it is cooled still farther, it then begins to expand, until it freezes and turns into ice. So ice occupies more space than the liquid water which is nearly cold enough to turn into ice, but not quite. When the frost comes, it often freezes the water in the pipes in our houses, and, as this means that the water, in the form of ice, occupies more space than it did before it was frozen, it cracks the pipes.

The water, when it freezes, is stretched, so to speak, to form ice, and bursts the pipe that tries to prevent it from stretching or expanding itself. This gives us some idea of the power of its expansion. Of course, as long as the frost continues, we do not notice any bursting of our water-pipes, but, as soon as the thaw comes, the ice in the pipes melts, the water runs out, and causes damage. Many people therefore think that the thaw bursts the pipes, but, as we see, they are wrong. The frost bursts the pipes, and the thaw only shows us that they are burst.

## WHAT IS THE BLUE LIGHT THAT WE OFTEN SEE ON THE SEA AT NIGHT?

This is sometimes called phosphorus, but it is not well to give it that name, for phosphorus is the name of a particular chemical element, and the light on the sea has really nothing to do with phosphorus.

But phosphorus itself shows this light, and so the light gets its proper name, which is *phosphorescence*. The light on the sea, and the light shown by phosphorus when it is exposed to the air, or to oxygen, are due to the same cause, the occurrence of slow burning, or combustion, or oxidation. There is no free, uncombined phosphorus in sea-water, and, though there are salts containing phosphorus, called phosphates, in it, they have nothing to do with its phosphorescence.

But the sea is really full of living matter, and of matter which has been alive—the bodies of dead sea-creatures, some animal and some vegetable. These are slowly oxidised by

the oxygen which is dissolved in the sea-water, and has been got from the air, and as they are oxidised, or burnt, they give out the faint light which we see.

## WHY IS IT EASIER TO WALK ON A ROUGH SURFACE THAN ON A SMOOTH ONE?

We might add to this question, Why is it easier to walk in boots that have nails in them than in new boots with slippery soles, and why are we wise to score the soles of new boots with a knife to make them a little rough? The answer to all these questions is the same, and it is that the roughness, whether it be on the ground, or on the soles of our boots, means friction, and without friction we cannot walk. Friction, or, to use a more familiar word, *rubbing*, means that the boot cannot slide along the surface of the ground, but stays without difficulty wherever we put it, and so walking is easy.

If we try to walk on ice with skates, we shall soon learn how important friction is for easy walking. We learn, too, that we *can* walk even without much help from friction, but, in order to do so, we must balance ourselves very carefully, so that there is no tendency for the boots to slide in any direction. As long as the weight falls equally on the whole of the boot, or the skate, there is nothing to make it slide, but it will slide if the weight falls unequally, unless friction prevents it. If there is enough friction, as there is when we walk on a rough surface, we can take big steps, and need not trouble to balance our bodies carefully, for the friction will prevent our boots from slipping or sliding along the ground.

## WHY DO OUR HANDS REMAIN DRY WHEN DIPPED IN QUICKSILVER?

Mercury, or quicksilver, is a true liquid, just as much as water is, and it can flow just as water can, if the conditions are right. When we dip our hands in water and withdraw them, the water clings to the skin, so that it wets the hands. There is sufficient attraction between the water and the surface of the hands to make this possible; though, even in the case of water, it all depends upon circumstances. For instance, we may coat our hands thickly in oil, and then we find that the attraction between the water and the oil is so small that our hands are not wetted, or scarcely wetted at all. Mercury

behaves to the hand in its ordinary state as water does to the oil covered hand. Also mercury is a very heavy thing and so tends to fall back when the hand is withdrawn even though some of the mercury may try to cling to it. Even when the hand is perfectly clean it is still much more oily than we think and it is not possible to free the hand entirely from oil for the skin of the hand actually produces oil to some extent. But if we use something that is quite free from oil we can sometimes get mercury to flow over it and wet it in just the same way as water would though never so freely as water will.

HOW CAN A FEW IRON RODS BARE THE WEIGHT OF A SUSPENSION BRIDGE?

Well in the first place it very much depends upon the iron. No one would try a very much to a suspension bridge made of any ordinary kind of iron. But if we melt—for that is what we really do—the right proportions of carbon in the iron and get them to mix and hold together in the proper way, then we get a new kind of iron which is vastly different and vastly stronger. It is this steel as we call it of which suspension bridges are made. No human being can say how or why it is that steel has the wonderful property upon which the building of suspension bridges depends. All we can say is that steel has a wonder of power of resisting anything that tries to extend or stretch it. The power of resisting extension is called tensile strength. The tensile strength of good steel is amazing and in the last few years steels still more wonderful have been made of a wire of a mile with upper extremity was hit. But I do not suppose that many can be imagined as iron can when it has this very subtle allied to it. Make steel

**WHAT STAKES IS RICH WHEN WE ARE HOT?**

When we say we are 14 we mean that we feel that way most of the time but at other times we feel like we are 10 or 12. We know that we are 14 because we are 14 years old. We know that we are 14 because we are 14 years old. We know that we are 14 because we are 14 years old.

rushing through the skin affects the heat nerves and we feel hot. Of course when there is an unusual amount of blood in the skin its colour shows and so we look redder than usual. So the question would be just as right if it were put in this form: What makes us feel hot when we are red? When we have been burnt or have had our chest rubbed with camphorated oil or when we have a red skin from exposure to the sun that part of it will feel hot and the heat nerves feel the warmth of the unusual supply of blood around them.

The question has another answer. The reason why we get tired when we are really hot is in fever, and when we have been running hard and making a lot of heat in our muscles is that the case of heat must be got rid of. So the blood is allowed to flow more quickly and freely through the surface of the body—enables us to become cool and then it is made cool.

### WHY HAS WATER NO TASTE?

It is perfectly true that pure water has no taste, but probably not so many thousands of those who read this question have ever tasted water that has no taste. Nor is it likely ever to be tasted pure, as unless we have been to the clouds and have tasted water that has been distilled. The ordinary water we drink in quantities of undissolved lime, and therefore it has taste. It also has a certain amount of solid substance. If we boil water we drive off the gas content, and then it has better taste, but not that. It is in the region where most of the new ways in which to produce water are being worked out, and it is not even the best. Why pure water will have no taste is very plain. All that is in a heavy liquid water. The correct time and place for it is in the form of

millions of water molecules, and if they are water, they are easy to expect to taste. It is not the water itself that is the problem. That is why it is so easy to taste. The water is

the same as the water in the

soft water, but it is not

the same as the water in

the water in the water in

# THE MAN WHO MADE THE WORLD HIS PARISH



John Wesley has been called the man who saved England, for when he began his preaching the people in many parts of the country were practically heathen. And yet this man was almost lost to us. When he was but six years old his father's house was set alight by evil men, and John, who had been forgotten in the excitement, was only rescued from a window at the last moment. An instant later the burning roof of the house fell in.



after his long and splendid life, Wesley lay on his deathbed, with a few of his most intimate friends around him. He tried to repeat a verse of a psalm, but his weakness was too great. He said, "I'll praise thee—I'll praise thee—fare thee well!" Then with a last "Fare thee well!" he passed on.

# The Child's Book of MEN & WOMEN



This is the kind of work that moved the great social reformer to take up the condition of the little boys who were brought on their parents by sweeps, and made to climb inside chimneys to clean them.

## SOME FAMOUS REFORMERS

energy of his mind, he consecrated the hours of his life to the sacred cause of Justice. Again and again he failed, indeed, if we look at what he actually accomplished, we may say that he never succeeded. but because he did not lose heart, and because he repeated his efforts in the face of defeat, and never doubted that truth would triumph, other men after his death, in a less cruel age, carried his pioneer work to a successful conclusion. To-day, the English Law punishes only one crime with death. This great triumph is the result of the work begun by Sir Samuel Romilly.

Of all the works possible to men, none is greater than making other men *better*. We must think of what that word *better* means. It means making a cruel father, a loving father, a bad mother, a good mother, a liar, truthful; a drunkard, sober; a thief honest, a sinner, pious. It is not difficult to make men happy, or clever or cheerful, it is most difficult to make them good. And remember, there is no man living, however good he may be, who might not be better: for the progress of man is eternal. It is because making men better is the supreme work in the world, that John Wesley shines on the page of history like a star of the first magnitude.

#### JOHN WESLEY, WHO SPENT HIS LIFE IN SAVING ENGLAND

He not only made a few men better but he made hundreds of thousands of men better. And this, too, in an age which was apparently dead to religion, dead to seriousness, dead to everything that was not frivolous, empty, and vain.

And how did John Wesley do this great work? How was it that he saved the soul of England in the eighteenth century? He mounted a horse and rode to all those parts of England where the respectable working class lived, and preached to them the religion of Christ. He avoided the rich, he did not seek the hopelessly vile, in order to save both the rich and the vile, he made his appeal to the magnificent forces of England's working class. And the working class saved England.

John Wesley was a clergyman's son. His father had nineteen children. John Wesley was used to no luxury. His mother whipped her children in order to teach them to cry softly. He was strictly trained, but the harshness of

his childhood could not destroy in him the glowing light which illumined his noble spirit—the light of God's love. He believed implicitly that God *loves* every man, woman, and child, loves them, and desires them to be good only that they may be capable of appreciating the great joys which, after death, await those who love what is right, and hate anything and everything that is evil.

#### HOW A POOR MAN GAVE AWAY THIRTY THOUSAND POUNDS

When he went to Oxford, Wesley had £30 a year, he lived on £28, and gave £2 away. Next year he had £60, he lived on £28, and gave £32 away. Next year he had £90, and the year after £120, he still lived on £28 a year, and gave the rest away. It is said that during his life he gave away £30,000.

There were some very foolish men in the Church of England at that period, who so ill-treated Wesley and disheartened him that he worked on his own lines. He built chapels wherever he went, organised a great society of worshippers, and preached in the fields and in the streets to anybody who would listen. Sometimes he was roughly used by the mob, but he never lost heart. He used to travel some 5,000 miles every year, generally on horseback. "No man," it has been said by a living statesman, "did such a life's work for England."

He lived to be eighty-eight, and almost his last word was the joyful exclamation "The best of all is, God is with us!" That was the secret of his life. He felt that God was with man, helping, in His own wise and patient way, the work of improving the human race. Among our English heroes, we should always be proud of Wesley.

#### A MAN WHO USED TO RISE AND PRAY IN THE MIDDLE OF THE NIGHT

John Howard was a queer, quaint, delicate, and studious man. He fell ill as a young man, when he was living in lodgings, and not knowing how to express his gratitude to his landlady for all her kindness to him, insisted upon marrying her. He was just over twenty, and she was just over fifty. He used to get up at two o'clock in the morning in the bitterest winter weather, to examine a thermometer at the bottom of his pocket. He did not eat animal food. He had usually left his bed and



they lived by rule and method—were beginning to attract attention, and Whitefield joined their fellowship and practised the most severe habits of existence. He was ordained deacon in 1736, and two years later set out for Georgia, in America, at the invitation of Wesley. The effect of his preaching is told by Franklin, who once heard Whitefield appealing for funds towards a scheme of which Franklin did not approve.

"I silently resolved he should get nothing from me. I had in my pocket a handful of copper money, three or four silver dollars, and five pistoles in gold. As he proceeded I began to soften, and concluded to give the copper; another stroke of his oratory made me ashamed of that, and determined me to give the silver, and he finished so admirably that I emptied my pocket wholly into the collector's dish, gold and all."

**G**EORGE WHITEFIELD, WHOSE POWERFUL PREACHING MADE BAD PEOPLE GOOD

Whitefield spent his life in preaching. He journeyed all over the British Empire, and everywhere he went people flocked to hear him, and, by his wonderful preaching, were converted to live better lives. The sceptic Hume has told us one of Whitefield's appeals. "After a solemn pause, Mr. Whitefield thus addressed his audience: 'The attendant angel is just about to leave the threshold and ascend to heaven, and shall he ascend, and not bear with him the news of one sinner, among all the multitude, reclaimed from the error of his ways?' Stop, Gabriel! Gabriel, stop ere you enter the sacred portals, and yet carry with you the news of one sinner converted to God!"

When he preached in London early on winter mornings, the streets near the chapel would be bright with lanterns carried by the multitude flocking to hear him. When we think of his origin, and the terrible atmosphere in which the impressionable years of his boyhood were spent, are we not amazed that by speaking of God this man should have drawn hundreds and thousands of people to forsake idle, evil, and useless lives for the pure, unselfish, and helpful life commanded by Christ? George Whitefield teaches us that more can be done by speaking of God than by Acts of Parliament. He did not

change the conditions of men's lives, but he changed the lives themselves. William Wilberforce was first known as "the Nightingale of the House of Commons," because of his beautiful voice and his skilful eloquence—eloquence that always held his listeners spellbound.

**W**ILLIAM WILBERFORCE, WHO BECAME THE CHAMPION OF THE SLAVES

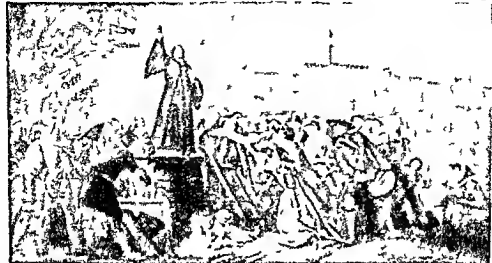
He lived to earn the greater and grander title of "the good Wilberforce." He was born in Hull, the son of a successful merchant, and from youth was of a benign and gentle nature. He went to Cambridge, and travelled about with William Pitt and Dr. Milner, enjoying the sights he saw, and forming his judgments on religious questions. When he returned to England his life was consecrated to the service of the Christian religion, and he entered the House of Commons to make right reason and the will of God prevail. All his speeches were on the side of justice, honour, and goodness. Finally, he became the champion of the oppressed slaves, the burning denouncer of the terrible and degrading slave-traffic.

In his first great speech on this question he described the slave-trade as the most complete system of injustice and cruelty exhibited to the world. "In other evils," he said, "some good might be detected. Hurricanes purify the air, persecution excites enthusiasm for truth, pride, vanity, and profusion frequently contribute, indirectly, to the happiness of mankind. There is nothing, however odious, that has not its palliative; the savage is hospitable; the brigand is intrepid, violence is, in general, exempt from perfidy, and daring iniquity from meanness. But there is no benign concomitant here; it belongs to this hateful traffic to deteriorate alike the good and bad, and even to pollute crime itself; it is a state of warfare undignified by courage, it is a state of peace in which there is no security against devastation and massacre."

**H**OW WILBERFORCE BELIEVED IN DOING RIGHT, WHATEVER HAPPENED

Against these arguments was raised one objection. The traffic was wicked and inhuman, but it was useful to the empire. At this the eloquence of Wilberforce blazed forth with righteous indignation. "What is it," he cried of this argument, "but to establish a

## THREE MEN WHO CHANGED THE WORLD





competition between God and Mammon, and to adjudge the preference to the latter? What but to dethrone the Moral Governor of the World, and to fall down and worship the idol of interest? What a manifesto to surrounding nations! What a lesson to our own people! Come, then, ye nations of the earth, and learn a new code of morality from the parliament of Great Britain. We have discarded an old prejudice, we have discovered that religion, and justice, and humanity are mere rant and rhapsody!" He boldly declared that if these principles were accepted the whole orb of civilisation would be shattered. "Men must then retire to caves and deserts, and withdraw from a world become too bad to be endured."

We see what William Wilberforce stood for. It was for Right, whatever the consequences. He believed in one God, he made no obeisance to Evil.

His burning eloquence converted England. From his place in the House of Commons this noble Englishman broke the chains of slavery and released thousands of slaves to become men in the world of men. The hideous torture of the slave-traffic ceased, and one of the foulest blots on the flag of England was wiped away by the hand of this great reformer.

#### ROBERT OWEN, THE MAN WHO MADE THE FACTORY CLEAN AND HEALTHY

Robert Owen is a name that meets us frequently when we grow up. What did he do? What was his work in the world which has endured? He was one of the very first men to improve the terrible conditions of the factory people which existed at the beginning of the last century. To-day labourers flock from the country to work in factories. When Robert Owen lived, no respectable country person would enter one of these places. They were filled with the lowest of the low—children from pauper schools, and the refuse of city populations, their wages were beggarly, their hours were long, their souls were left to rot.

The great change is the work of Robert Owen. The hours of factories have been limited, children of tender years are no longer employed, inspectors constantly visit these places to see that the workpeople live in proper sanitary conditions; a factory hand is

now an intelligent, sober, self-respecting and industrious citizen. Robert Owen began life very humbly. His father had a small saddlery and ironmongery business in North Wales. At ten years of age Robert was working in a shop. He was a clever, practical boy, and went on advancing until he became manager of a cotton-mill in Manchester.

#### HOW ROBERT OWEN'S FACTORY BECAME THE MODEL FACTORY OF THE WORLD

While he was still young he became the part-owner of a cotton-mill in New Lanark. It was here that his great work began. He shortened the hours of labour, he established schools for the children, he opened a store where the workpeople could buy food and clothes cheaply, he improved their dwellings and taught them habits of thrift and cleanliness. It comes as a shock to hear that the people who had money invested in this mill rose up against Robert Owen because he was spending so much money on the workpeople. That is what happened. But Owen's noble work had attracted the attention of good people throughout the country. His mill was visited by reformers, philanthropists, and royalties. It was considered the model factory of the world.

But when his partners quarrelled with him it was difficult for him to get money enough to start another mill. There were many people ready to help him. Parliament listened to him. He was reckoned to be the one man who could solve the great problems of poverty and crime. All the world, indeed, was looking at Robert Owen.

#### THE SAD FAILURE OF A REFORMER WHO FORGOT GOD

And then a sad thing happened. This good man was perfectly deaf to the searching question of religion, "What shall it profit a man if he gain the whole world and lose his own soul?" He thought it was enough to provide people with good houses, fair wages, and sufficient time for leisure. He was interested in their minds, their stomachs, and their limbs. He thought nothing of their souls. And so it happened, that when people discovered that this good man was shutting God out from His own world, many turned against him. He started socialistic communities, but they failed. He lost his money, his



What would have happened to England if this noble man had not forsaken his private grief, and laboured for a repeal of the Corn Laws, it is difficult to think. Want and starvation had brought the people to a dangerous and reckless mood—a mood when reason is thrown away and, like famished wolves, the multitude becomes a pack, urged forward by one impulse—hunger. It was to John Bright that the nation listened. Cobden argued Bright appealed. His appeal was made to righteousness, to justice, to God. The nation listened, was moved, and was converted.

The long course of Bright's life was devoted to humanity. He made some mistakes, but, on the whole, his record is a splendid one. Like Cobden, he hated war. He did great work for peace. We shall find, as we grow older, that all the heroic work in the House of Commons has been carried forward by deeply religious men. Religion is the supreme impulse. John Bright was one of the great forces in the House of Commons because he did not think of his party, did not seek popularity, but guided his conduct always by the voice of conscience. His life stands out in the annals of England, telling us that it is good men—the men who think of others before self—who save the world.

#### ROBERT RAIKES, THE PRINTER WHO GAVE SUNDAY-SCHOOLS TO THE WORLD

We owe our Sunday-school—an institution which has accomplished enormous good—to a printer living in Gloucester. This was Robert Raikes, who was born in 1735, and who, at the age of twenty-two, succeeded his father in the printing business. It was not until twenty-three years after this that he started the first Sunday-school.

With a few others to help him, the good printer opened a school for children on Sunday, children who would otherwise have spent the day in the streets flocked to receive instruction in religion. The venture was so successful that Robert Raikes published an account of it in the newspaper which he published, the "Gloucester Journal." This notice was copied into some of the great London journals, and attracted wide attention. Such was the beginning of our Sunday-schools, and Robert Raikes lived to see his little experiment in Gloucester copied all over England.

One of the best aristocrats who ever denied himself the luxuries and pleasures of high estate to minister to the poor and suffering was the great Lord Shaftesbury, who died in 1885. The poor of London loved this man beyond all others of his period. There must be many men in East London who are saying to-day that they owe their happiness to the good earl.

#### LORD SHAFTESBURY, A GREAT NOBLEMAN WHO GAVE HIS LIFE FOR THE POOR

Lord Shaftesbury was one of the chiefs of the Ragged School Union, for over forty years he was its president; and during those forty years he made acquaintance with thousands of poor boys and poor girls, and encouraged them to live noble and useful lives. He used to go into the East End, visit the darkest slums, and make friends with the vilest and the lowest, as well as with the poor and the suffering.

The good works of the world are numerous, but few have accomplished so much quiet and lasting good as that most merciful and Christlike institution, the Ragged School Union. If we would know what religion really means in the world, we should go to see Sir John Kirk of the Ragged School Union, and ask him to tell us about the work of the good Lord Shaftesbury.

William Morris is a reformer different from any of those we have read about. His life shows us how various are the ways in which a man can work for the improvement of the world. When he was a little boy he would dress up in toy armour, mount a pony, and ride into Epping Forest, dreaming of old romances. He loved flowers. He knew all the animals of the forest. He could recognise any bird by its flight. The little boy was in love with Nature.

#### WILLIAM MORRIS, WHO TAUGHT MEN TO STRIVE FOR BEAUTY

When he went to Oxford he wanted to be a clergyman, and there he met another scholar, whose name was Burne-Jones who had also come to Oxford with the same purpose. These two young men became friends, and in their conversations they talked about making the world a happier place. Gradually it came to them that they could do more work for the world as artists than as clergymen. In those days people cared very little for

FRIENDS OF THE POOR AND OPPRESSED

[illegible]

beauty. Furniture was chosen for its strength, curtains and carpets for their wearing qualities, houses were built without any respect for beauty.

William Morris saw that houses and furniture form what we call a man's "environment," and that a person is affected by his surroundings. If we live in a dingy room we find it hard to be cheerful. If we are always looking at ugly things our mind will sooner or later become either ugly or bitter.

#### HOW MEN'S LIVES ARE MADE UGLY BY UGLY SURROUNDINGS

Long before Morris lived men had seen that evil surroundings were bad, and the Church had always striven to rescue people from living with wicked persons in bad places. Morris did exactly the same work for beauty. He saw that ugly surroundings had a bad effect upon people, made them coarse, vulgar, stupid, even wicked. He set himself to teach the great lesson that beauty is something for which men should strive, because it is better than ugliness.

If we look in the windows of many furniture shops we see that the chairs, and sideboards, and washstands all aim at being grand. In the poorest parts of London we find these dreadful plush-covered chairs, these gaudy carpets and rugs, these "grand" wardrobes and washstands. Many people mistake grandeur for beauty. Morris set himself to fight this terrible idea. He succeeded largely, but the mass of men to this day remain dead to beauty. Morris not only made furniture, but he even designed wall-papers. He printed books on beautiful paper in a beautiful way. Everything in life, he felt, must be beautiful.

#### HOW WILLIAM MORRIS STRUCK A BLOW AT VULGARITY AND UGLINESS

It was William Morris who first struck a blow at the vulgarity and tawdriness that grew up in the Victorian Era. It was he who first inspired modern England with a desire for simplicity and beauty. This was a great work. Beauty is part of life. We must seek beauty as well as goodness. In seeking beauty we seek God for all that is of God is beautiful.

None of the men whose lives we have been studying found it easy to carry out their reforms, and Sir Rowland Hill, with whom our story closes, found his way no easier. He was born in 1795, at

Kidderminster, the son of a teacher, and himself became a teacher. His work made him conscious of the hard lot of the poor, and he helped to found the excellent Society for the Diffusion of Useful Knowledge. That, however, was only the beginning of his work. At that time to send a letter from London to Brighton cost 8d, and postage from London to Aberdeen was 1s 3d. Poor people could not afford to receive letters.

The sort of thing that happened was discovered by the great poet Coleridge. He saw a postman hand a letter to a poor woman at a cottage in the Lake District and demand its postage. She looked at the letter, then gave it back to the postman, saying that she could not afford the money. The poet paid the shilling, and gave the woman her letter.

After the postman had gone the woman told Coleridge that his kindness was wasted. She had an arrangement with her brother that if he were well he should send her a blank sheet once every three months. She, seeing it, would know that he was all right, and need not take in the letter, only paying the postage if there were any written matter in the letter, which would mean that he was ill.

#### A POET'S STORY THAT GAVE ROWLAND HILL THE DREAM OF THE PENNY POST

Hill, who heard the story, thought that a system which made brother and sister conspire to cheat was very dreadful, so he proposed that the postage for all letters in Great Britain should be a penny. The postmaster-general of the time said that the scheme was the wildest he had ever heard, and postal officials declared that it was bound to fail. Hill, however, continued to advocate the reform, and in 1840 it was carried. He was appointed to carry out the reform, but a year later another government came into power and dismissed him. In 1854 the former government returned to office, and he was reappointed, and carried out his splendid scheme completely. He organised the parcels post too, and the money-order system. His reforms have done more good for the nation than anyone can estimate. Hill was made a knight and granted a pension of £2,000 a year, and he was also given £13,000 by his admirers and £20,000 by the government. The next Men and Women begin on page 3737.

The Child's Book of  
SCHOOL LESSONS



READING

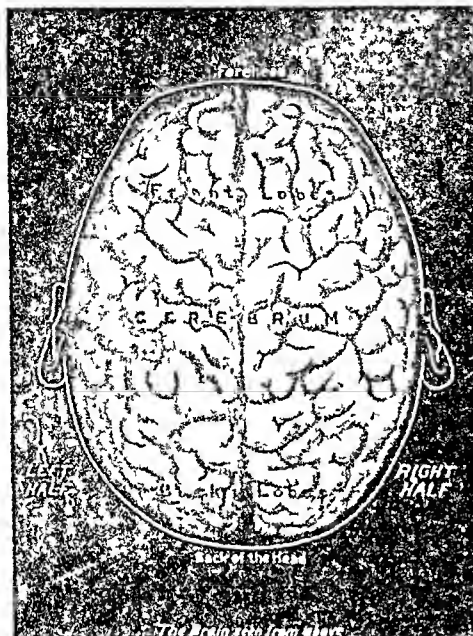
FOREIGN WORDS AND PHRASES

- A l'outrance—A frequently-made error for à outrance, French
- Alter ego—Literally, other self; used sometimes for a bosom friend and sometimes for someone else with a close resemblance Latin
- Alter idem—Another of the same Latin
- Altesse—Highness French
- À majori ad minus—From the greater to the less, sometimes the last two words are omitted Latin
- À merveille—Wonderfully French
- À minori ad majus—From the less to the greater, the last two words are frequently omitted Latin
- À mon avis—In my opinion French
- Amor vincit omnia—Love conquers all things Latin
- Amour propre—Self-esteem French
- Ancien régime—The old order of things French
- Anno domini—In the year of our Lord, usually written A D Latin
- Anno mundi—In the year of the world, usually written A M Latin
- Annus mirabilis—Year of wonders Latin
- Ante bellum—Before the war Latin
- Ante Christum—Before Christ, frequently written A C, but B C is more common Latin
- Ante meridiem—Before noon Latin
- À outrance—To the bitter end French
- Apologia—Apology Greek
- A posteriori—From effect to cause Latin
- Appartement—A suite of rooms, a flat French
- À priori—From cause to effect Latin
- Aqua fortis—Strong water, the name given to nitric acid which dissolves nearly all metals except gold and a few other precious metals, Latin
- Aqua regia—Literally, royal water, applied to a mixture of nitric and hydrochloric acids, which dissolve gold when mixed but do not do so singly Latin
- Aqua vitae—Water of life Latin
- Arx longa vita brevis—Art is long, life is short Latin
- À tout force—By all means, French
- À tout prix—At any price French
- À travers—Across French
- Au contraire—On the contrary French
- Au courant—Fully informed French
- Au fait—Well acquainted French
- Au fond—To the bottom French
- Auf Wiedersehen—Till we meet again German
- Au plaisir de vous revoir—Till I have the pleasure of seeing you again French
- Au revoir—Until we meet again French
- Autres temps, autres mœurs—Other times, other manners French
- Aux armes—To arms French
- Avant-coureur—Forerunner French
- Ave, Caesar, morituri te salutant—Hail, Caesar, those about to die salute thee, the greeting of the gladiators Latin
- Ballon d'essai—A trial balloon, a "feeler" French
- Belles-lettres—Literally, fine letters, elegant literature, poetry, fiction, and criticism French
- Belle vue—Fine view or prospect French
- Bête noir—Black beast, pet aversion French
- Bien—Well French
- Bien-aimé—Well-beloved French
- Bis—Twice, again French
- Bona fide—In good faith Latin
- Bona fides—Good faith Latin
- Bonhomie—Good nature French
- Bon jour—Good morning French
- Bon marché—Cheap, a good bargain French
- Bonne foi—Good faith French
- Bon soir—Good evening French
- Bon ton—The height of fashion French
- Bon vivant—Good liver, jolly fellow French
- Bon voyage—A pleasant journey French
- Bourse—Stock Exchange French
- Café au lait—Coffee with milk French
- Café noir—Black coffee; coffee without milk French
- Cap à pie—From head to foot Old French
- Carte blanche—Literally, a white card, full power to act French
- Casse-tête—Reason for war; Latin
- Cause célèbre—Famous trial French
- Cave canem—Beware of the dog Latin
- Centum—A hundred, generally written cent Latin
- C'est-à-dire—That is to say French
- C'est magnifique, mais ce n'est pas la guerre—It is magnificent, but it is not war, the historic saying of a French General who witnessed the charge at Balaclava French
- Chemin de fer—Railway French
- Cherchez la femme—Look for the woman, there is a woman at the bottom of it French
- Clue—Stylish French
- Cogito, ergo sum—I think, therefore I am, the famous proposition of the French philosopher Descartes Latin
- Coiffeur—Hairdresser French
- Comme il faut—As it ought to be, gentlemanly or lady-like French
- Compos mentis—Of sound mind, sane Latin
- Concours—Competition French
- Contretemps—An inopportune happening, a hitch French
- Corps diplomatique—Diplomatic body French
- Coup d'état—An unexpected stroke of policy French
- Coup de grâce—Finishing stroke French
- Crème de la crème—Cream of the cream French
- Cul-de-sac—Literally, bottom of the sack, a street open only at one end French
- Cum grano salis—With a grain of salt, with some allowance for exaggeration Latin
- De die in diem—From day to day Latin
- De facto—From the fact, actual Latin
- Dei gratia—By the grace of God, frequently written D G Latin
- Dejeuner—Lunch French
- De novo—Anew Latin
- Deo gratias—Thanks to God Latin
- De profundis—Out of the depths Latin
- De rigueur—Indispensable French
- De trop—Too much or too many, intrusive French
- Deus ex machina—Literally, a god from the machine; an apparition forced method or device in a plot Latin



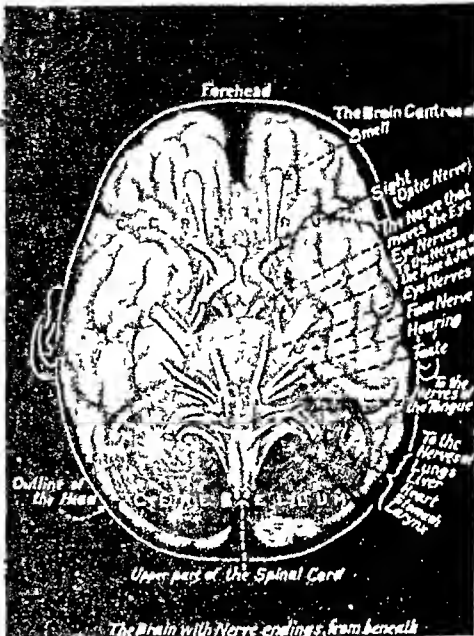


# THE INSIDE AND OUTSIDE OF OUR BRAINS



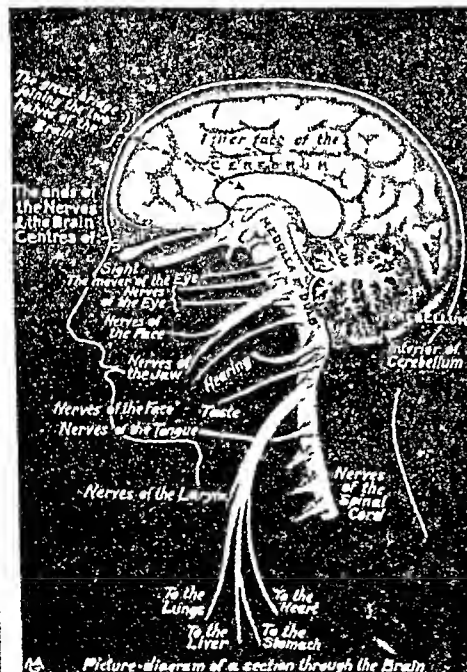
The Brain seen from above

In this picture we see what our brain would look like if the top of our skull could be lifted like a lid. The cerebrum, or new brain, is the part by which we reason out things, and it completely covers the cerebellum



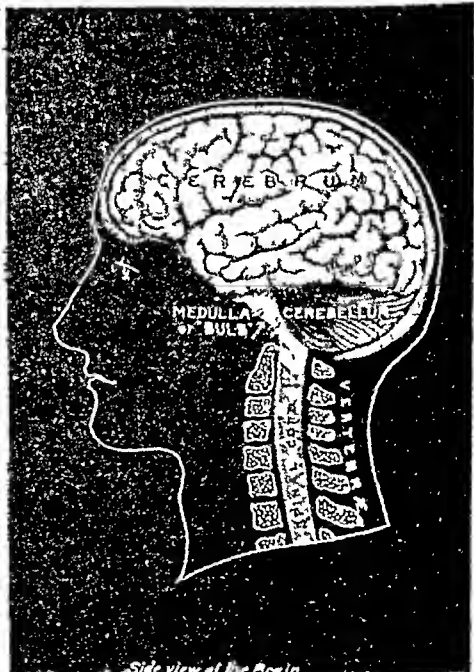
The Brain with Nerve endings, from beneath

Here we are looking up at the underneath part of the brain, and see the nerve-endings of the various senses and of the vital organs, all cut off short, except the nerve of smell, which is shown ending in a bulb



Picture-diagram of a section through the Brain

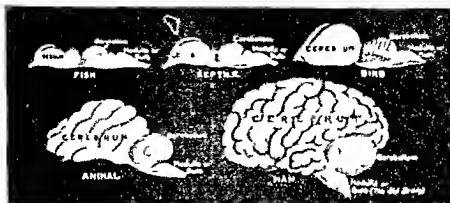
This section of the brain, as seen from the side, should be compared carefully with the picture of the brain seen from underneath. In both pictures, the nerves are shown in the order in which they leave the bulb, or old brain



Side view of the Brain

In this side-view of the brain, we see the proportion of the skull occupied by the brain. The convolutions, or folds, are shown, and the position of the brain in relation to the spinal cord and the backbone is easily seen

# The Child's Book of Its Own Life



These diagrams are not compared to a man's brain with the brain of other animals. The size of the brain is drawn in proportion to the size of the creature's body, not to that of the brain itself.

## THE MYSTERY OF THE BRAIN

of his whole body, is simply gigantic. But though this is so, it very feebly indicates what the huge growth of man's brain has been, simply because the brain has grown far more quickly than the skull, as life has ascended, and has deeply tucked in its surface, here and there, as it went on growing, until there is now as much, or perhaps considerably more, of the surface of the brain tucked away than shows on the outside. In general, the higher the type of brain, the more is its surface folded. We can show this whether we trace the brain upward in different kinds of animals, or whether we compare different human brains with one another. As animals have become more and more clever, and have trusted more and more to brain and skill, rather than to size and strength, the surface of the brain has become more folded, and people who study the subject can tell in a moment, by looking at the surface of the brain alone, whether it belongs to one of the older kinds of animals or to one of the cleverer animals that have more lately appeared on the earth.

#### THE MANY FOLDS IN THE BRAINS OF VERY CLEVER MEN

A great many brains of famous men have been examined, many great men, indeed, have left orders that their brains should be examined for the advance of knowledge. As a general rule, these brains are found to be very highly folded. The contrast is very great between them and the brains of, say, such a humble type of mankind as the Bushman of South Africa. Of course, this means that if we could unfold all the brains in question, and stretch out their surfaces quite flat, the cleverer brains would be the brains with the biggest surfaces.

The size of the skull, its shape and the bumps on it, can tell us absolutely nothing whatever as to how much the brain is folded, still less as to what we shall find when we examine more closely what the foldings are made of. There is, on the whole, and in a very rough way, some correspondence between the size of the skull and the size of the brain inside it. But, for one thing, skulls vary in thickness, and, for another, no one can possibly tell what it is that is making up the size of the brain. Even if all skulls were the same thickness,

and even if bumps corresponded to the brain, which they never do, the brain inside might be large because certain spaces inside it were swollen with fluid, or it might be large but have a comparatively smooth surface. It is quite easy to understand that a well-packed brain, which will go into a much smaller skull than another, may yet, if unfolded, turn out to have a far greater surface.

#### WHY THE SKULL CAN TELL US NOTHING ABOUT THE BRAIN

About a hundred years ago, when practically nothing was known about the brain, men thought that, by feeling and measuring the skull, they could learn about the brain, and so tell the character of the person to whom it belonged. Our modern knowledge of the brain has taught us that it is hopeless to expect this, simply because the things that really matter do not affect the skull at all. If a very large and dangerous surgical operation were performed, so that a considerable portion of the brain were exposed and could be seen, then we might, perhaps, make a very rough guess as to what the person was like, but as we should have to judge how far we were right entirely by what we knew of the person in the ordinary way, it is difficult to see where the advantage of such an operation would come in.

Now, we must understand why it is that the surface of the brain matters so much. Directly we cut through the cerebrum of any of the higher animals, we find at once that it consists of an outside layer, which is grey in colour, and an inside layer, which is white. This grey layer, which covers the entire brain, always dips down and up again wherever the brain is folded. There would be no meaning in the folds if it did not. It is often called the *mantle*, that is, something which is stretched all over the outside of the cerebrum.

#### THE REAL BRAIN OF MAN THAT IS THE MOST WONDERFUL THING WE KNOW

At no part whatever of either half of the brain, whether we look at the part it rests upon or in the depths of any of the folds, do we find this wonderful mantle lacking. It is the real brain, and, as we find it in mankind, it is the most wonderful thing of which we have any knowledge. It owes its grey colour, and all its meaning and wonder, to the fact that

it is mainly made up not of nerve fibres but of nerve-cells. The rest of the brain is made up of nerve fibres or nerves and these give it a white appearance like that of an ordinary nerve in the arm or the leg but the grey mantle contains only comparatively few nerve fibres which connect its different parts in some degree.

HOW THE REAL BRAIN IS MADE UP OF THOUSANDS OF MILLIONS OF CELLS

What really makes up the grey mantle is thousands of millions of nerve-cells. These nerve-cells are vastly more wonderful even than those we find in the spinal cord or those which live in the bulb and control our breathing for they have to do with thinking, not to mention seeing and hearing and so on.

Only a very few years ago it used simply to be taught that when we take a very thin layer of this grey mantle and look at it under the microscope we see five layers of cells in it - on the very surface of the brain and so on until the fifth lies next the white matter inside the brain. We can recognise these five layers because the cells in the different layers differ rather from one another in their size and shape and number. But now we can go much further than that. It is in general true that we find about five layers of cells in any part of the grey mantle that we care to examine, but we also find that the cells differ very distinctly in different parts of the brain. Also if we carefully examine corresponding parts of the brain in lower animals of quite different kind we find that at the same time a rearrangement of cells occurs in corresponding places.

THE LIKENESS BETWEEN THE BUSINESS OF  
A MAN AND THE BUSINESS OF AN ANIMAL.

If we showed a man who had studied the subject a large number of cells shaped like pyramids and arranged in a certain way in very lively cells, it would be a great deal of trouble to explain to him that he could say in a moment that that was the picture of the brain which the man used when he wanted to make his words.

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

animal smell with. No one has the least idea yet what this particular group of nerve-cells has to do with smelling but we always find them in the small part of the brain and nowhere else. This is equally true of creatures like the dog, in whom the small part of the brain is large and of creatures like ourselves in whom the small part of the brain is comparatively quite tiny.

The parts of the brain which have to do with sight and with hearing are just as definite in their structure so that it is vastly easier to tell that we are looking at something taken from the vision part of the brain than to tell what number it was taken from.

The whole of the surface of the brain has been mapped out into very small patches. On page 3712 we see a picture of one side of the human brain showing different parts which we know have special duties.

## WHO A MAN'S BRAIN IS BETTER THAN AN ANIMAL'S

Now when we have carefully learnt to map out the various brain centres, as they are called for the motion of muscles for feeling from the skin for sight hearing taste and smell we find that still the greater part of the whole surface of the brain is actually unoccupied. It is almost as if the greater part of the surface of the brain had no duties. We cannot find that it is anything to do with any of the duties that we can think of.

Now when we begin to examine the  
beam of either an mite it may be  
common possible to take hold we say  
ten or twenty different beams and arrange  
them in an ascending or descending  
with the beam that is very small  
and as we go on we find that the  
size of the beam is not a matter of  
the size of the beam. If we find  
that the beam is very small it is  
that of the beam and we find the beam  
to be the same as the beam of the  
beam of the beam. We have the  
beam of the beam of the beam.

Intend not to go far enough the  
whole day particularly on visitation  
days as they are full of people  
and noise. They will see how  
Hottel had it before him and  
will say that he was not going  
to let them know what he was  
doing.

bigger, but that they become gradually separated from each other by the growth of new parts of the brain which appear and come to lie between the old centres. This process goes on and on, until at last in mankind and only in mankind, it has reached the stage at which the various special centres, which long ago lay all together and *were* the brain have become mere patches that lie here and there on the surface of man's huge brain.

What, then, is the meaning and the duty of these great new places that have come into existence, and to which the growth in the size of the brain is really due? When we question them, they are, so to speak, silent, indeed, they have been called the silent areas. We shall surely get some help in our studies if we can trace the course of the nerve-fibres that run out from the nerve-cells in these particular areas.

#### THE WONDERFUL FIBRES THAT LINK ALL OUR SENSES TOGETHER

As regards the special centres, we find that the fibres from the cells in them run just where we should expect. The fibres from the seeing centre run straight to the eye, the fibres from the hearing centre are connected with the ear, the fibres from the centre for movement run down into the spinal cord and are connected with the nerves that go to the muscles. These facts of course, help to give us the key to the duties of these centres. If, now, we can find where the nerves run to from the silent areas, we shall guess what these areas really do, and it must be something very important indeed, because, whatever it is, it seems to explain the real difference between clever animals and stupid ones, high ones and low ones.

We find, then, that these fibres from the silent areas run in every possible direction, but in very definite groups and ways, to the other centres of the brain. What they do is to *associate* one part of the brain with another. I think we can understand that if there were no such things, then, though an animal might see very well, nothing that it saw would connect itself in that animal's mind with anything that it had heard or felt or smelt. Now, when we come to study the way in which we act the way in which we put two and two together, when we notice

how one thing makes us think of another thing, we begin to understand how it is that the *association fibres* make all the difference in the world between a high brain and a low one.

#### WHERE A MAN'S BRAIN DIFFERS FROM THE BRAIN OF A DOG

If we compare the spinal cord or the bulb of a dog with that of a man, there is nothing worth mentioning to choose between them. If we compare the new brain of a dog with that of a man, we find a difference, but it is one which mainly consists in association fibres and cells. If we compare the vision centre of a dog with that of a man, we find the two in the same part of the brain in each case, and with the same special type of cells.

The difference, however, is that the grey mantle in the case of man is much thicker; and when we come to inquire into what makes it thicker, we find that it contains a vastly greater number of fibres, which are running to it from other parts of the brain, and of new cells, which have nothing to do with seeing itself, but which send fibres out from the seeing centre to all the other parts of the brain. In general, then, we may say that the differences between a high brain and a low brain are, first, that in the various special centres the grey mantle is much thicker in the high brain because it is crammed with new association cells, and, second, that in the high brain the special centres are forced apart by the growth in between them of new parts of the brain, which do not mean the invention of any new kinds of senses, but mean bringing all the parts of the brain into closer relation and connection with one another.

#### SOME OF OUR SENSES THAT ARE MORE NOBLE THAN OTHERS

There are one or two very interesting exceptions to this rule, and they have a meaning. It must have struck all of us, if we ever think of our senses, that some of them are more noble than others. We agree—do we not?—that it is a more dignified thing to enjoy a picture than to enjoy a chocolate. Someone may say, "Well, in either case, we are simply using one of our senses, why is not one as good as another?" But when we suppose that vision and hearing are more noble than taste and smell, we are quite right.



when it was thought that anything good for a child must be something that it disliked, and that anything it liked must be mere amusement. Who would think that the real meaning of the word school is *leisure*—doing what we feel inclined to do? Yet so it is.

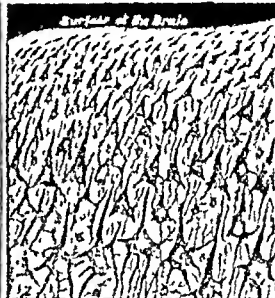
Now, there is nothing we notice more positively about an intelligent child, and any child is intelligent until foolish grown-up people begin to interfere with its mind, than that it loves using its fingers. Of course it gets into mischief, but the child that never got into mischief, and never touched things it ought not to have touched, was never yet taught to read. There are such children, but they can be taught nothing, and we call them *imbecile*.

Whatever happens, the healthy child must constantly use its sense of touch; it must for ever be fingering things.

Now, we find that the touch part of man's brain is simply magnificent. It is the delicacy and the variety of his sense of touch, and, far more than that, it is the marvellous way in which man's sense of touch is connected with



The left-hand picture shows a section across one side of the brain, and we see by the shaded border the thickness of the grey matter of the brain, as compared with the white nerve-fibres. On the right is a tiny speck of the grey matter, magnified a hundred times, showing the pyramid-like cells and the fibres



all his other senses, that accounts for our skill, which is almost the most wonderful thing about us as compared with any other creature. Not in a thousand years could any other creature but man be taught, for instance, to read with the fingers, even if that creature had a brain that could understand.

#### THE GREAT BRAIN PUZZLE THAT BAFFLED MEN FOR YEARS

For a long time it was a great puzzle to find the touch centre in man's brain. It lay, so to speak, under our very eyes, but we never thought of looking for it there. A very large area of the grey mantle on each side of the brain is the centre for voluntary movement, and it is here that the will of man gives its orders. For many years we knew this, and called it the motor centre, and when we were looking for the centre of the touch sense we never thought of

looking there. But now we have found that the centre for will and movement is the centre for touch. The two he mixed up together, and the connection between them is the closest of all connections in the nervous system.

#### THE WONDERFUL NERVES OF HEARING, THAT ENABLE US TO ENJOY MUSIC

The sense of hearing lives low down on the side of the brain, as we see in the pictures on page 3712. As we all know, this sense of hearing has led to the possibility of music and all that that means. As in the case of seeing, of course there must be good machinery outside the brain if a sense is to develop, and the history of hearing, like the history of vision, is partly the history of the ear and the history of the eye. Here, however, we must merely learn that the hearing centre of the brain is very large in mankind, and that when we examine

the cells contained in it we find a state of things that exactly compares with what we found in the case of vision. It may be that some animals can hear sounds so slight that we cannot hear them. That, as we have learnt

in the case of the eye and seeing, is not the test. No animal knows the difference between good music and bad; much less could any animal create a piece of music, even bad music.

Thus, this part of the grey mantle of the human brain is thicker than in any other creature, and, as we should expect, is very rich in association cells and fibres, that connect it with all the other parts of the brain. It seems, also, that there is a special part of the hearing centre, lying rather towards the front, which is concerned with music as distinguished from ordinary sounds; and though we do not know very much about this yet, it may be the case that this music centre is only found on the left side of the brain in right-handed persons, and on the right side of the brain in left-handed persons.

The next part of this is on page 3775.

# THINGS TO MAKE AND THINGS TO DO



## HOW TO SPEAK BY SIGNS

THE military method of signaling or the waggin, as it is sometimes called, is a splendid way to exchanging messages with those who are far beyond shouting distance but still in sight—on the ground, across a lake or river or a long stretch of seashore. A semaphore message will carry as far as the signaler and the person to whom he or she is signaling are within sight of one another while the apparatus for signaling is simplicity itself: a couple of semaphore flags being readily manufactured in a few seconds from two white pocket handkerchiefs which may then be pinned on to a couple of sticks cut from the nearest hedgerow or in a any cranny of a wall to hold them in position while about.

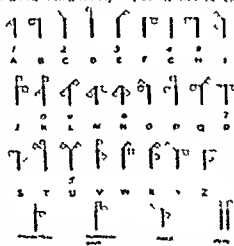
For instance if we are having a picnic on the beach and the boys have wandered off while the girls prepare tea it may be convenient to recall the former or if the picnic message is too effective than that about by the second, the Land's End and the pictures (p. 21) which will be seen.

Tea is ready! The first of these signs is a hand held the left arm about one foot high and the right arm to the ground as in the diagram. This is the signal for tea.

Let us see the first picture of the semaphore. We are looking at a hand held the left arm about one foot high and the right arm to the ground as in the diagram. This is the signal for tea.

The letters of the alphabet are shown in the picture on the page. Imagine the hand lines to represent the letters. The letter A is represented by holding the right hand high as if it were pointing midway between the VII and VIII of a clock dial, is using the feet of the smaller to be at VI in the VII. It is at VII. If we look at the picture of the signal A in the message on the page it will be clear. It is at VII.

For instance the letter A is represented by a piece of paper or a card with a picture of a hand holding a stick. The letter B is represented by a piece of paper or a card with a picture of a hand holding a stick. The letter C is represented by a piece of paper or a card with a picture of a hand holding a stick.



LETTERS AND SIGNS OF THE FLAG ALPHABET

For instance the letter A is represented by a piece of paper or a card with a picture of a hand holding a stick. The letter B is represented by a piece of paper or a card with a picture of a hand holding a stick. The letter C is represented by a piece of paper or a card with a picture of a hand holding a stick.



ready" message, it is made plain to us. The fourth circle shows the letters T, U, Y, and the sign for "cancel," all of which are made by keeping the right hand flag in the C position and changing only the position of the left-hand flag. We can compare this circle with the photograph of the letter T as shown on the photograph page. Circle No. 5 shows the right hand flag in the D position, where it is held when indicating the numerical sign, and also for J, or the alphabetical sign, and for V, the position of only the left-hand flag being changed for these different signs. Finally, the sixth circle shows that the letters W, X, and Z are indicated by holding the right hand flag in the E position and changing the position of the left-hand flag only.

Probably the meaning of the words "alphabetical sign" and "numerical sign" is not clear, and we shall have it explained. There are no special signals for the numerals, A standing for 1, and other letter signs for other numerals as seen in the picture on the preceding page. But in beginning a message, if it is to consist of letters, we make the signal for alphabetical sign first, thereby showing that the signs that follow are to be read as letters—A, B, C, and so on. Similarly, if, at the beginning, or in the course of a message, we wish the signs that are going to be made to be read as numerals, and not as letters, we make the numerical signal. The "annul" or "cancel" sign almost explains itself. It means that we wish the previous sign sent to be cancelled, perhaps because we find that we have made a mistake in transmitting.

Having seen the meaning of the various signs, we can proceed to see how a message is sent. To begin, we must stand in the position shown in the first picture on the photograph page, with the two flags slightly crossed over one another, facing the direction in which the message is to be sent.

We must next move both flags to attract the attention of the individual to be signalled to, and when we have succeeded, we must signal the letter J, which shows that letters follow, not figures, before returning to the first position. It has been seen that the letters of the semaphore alphabet are formed by the various angles at which the flags are held to the body, and, to send a message, we must stretch out the arms to their full extent, and hold the flags in a straight line with the arms, never allowing them to droop from the hands, and never

inclining them to the rear. We may, however, turn on the hips, if we are about to form any letter which can be made more easily and seen more distinctly from a distance by doing so.

We must be careful, when actually signalling, not to make the positions for the letters A and G too close to the body; and we must also remember, when making the letters T, O, and W, and the "numerical sign," to keep the two flags well separated from each other.

When signalling, the flags must be kept unlinked, and brought smartly and promptly from one letter position to another, the arms being brought right in to the body between each letter, and a pause must be made on the letter itself. A little longer pause should be made—the signaller standing with the flags crossed—between each word. The Army regulation speed for sending and receiving semaphore messages is at the rate of eight words a minute.

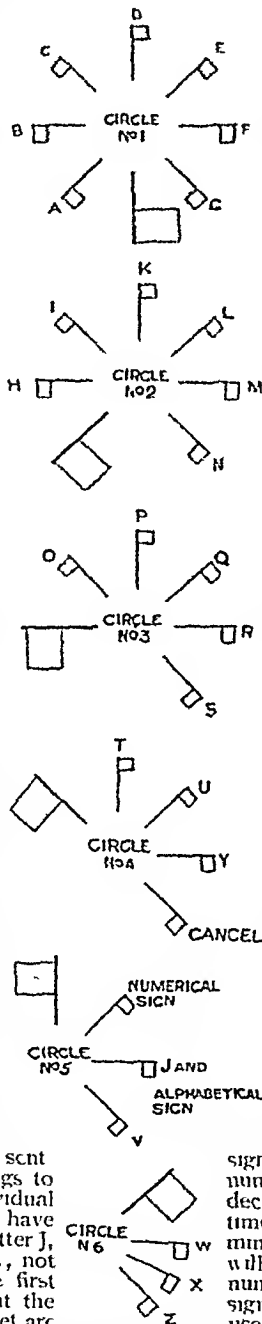
In order to receive a semaphore message in the correct military manner, two receivers are really required, one to take the actual message, and one to write down each letter as it is spoken by the taker.

It is the "writer-down's" duty to say "No" should a word fail to make sense, when the receiver of the message will immediately stop the signaller by raising both arms horizontally to their full extent. The signaller will show that he has understood this by signalling back J. The receiver—who should also be armed with two flags—will then send the last word which he received correctly, when the signaller will continue with his message from that word.

To make our knowledge of signalling complete, we should practise sending figures after we have become perfectly proficient in the alphabet.

It is most useful to be able to signal the time, and the signalling instructions say that the numeral sign will be used for the decimal point, and when sending time, to separate the hours and minutes, thus, for instance, 5.30 will be sent. Numeral sign, 5, numeral sign, 3, 0, alphabetical sign—the alphabetical sign being used to show that letters, not figures, will follow from this point.

The semaphore code, by the way, makes a splendid schoolroom cypher, while to the uninitiated a letter looks like nothing except a row of more or less meaningless scratches, of which no sense can be made.



The flag alphabet shown in circles



# MAKING A SIMPLE TELESCOPE

IT is possible to make a telescope, out of cardboard, that will show the mountains and dead volcanoes in the moon, of which we have all read. With this telescope we shall be able to see the moon so clearly that it will seem quite close, and we shall find it a fascinating world to watch. When it is "new" we can see the great mountains just catching the sunlight on their tops, and then, night after night, we may see the sunlight creeping towards more and more mountains, and flooding them with white light until the whole beautiful surface is bright and glowing.

Now, a simple telescope is merely a long tube with a glass lens at each end. It does not matter what the tube is made of. We are going to make ours out of sheets of brown paper, which will be stuck together until we have formed stiff cardboard. First we must find a piece of curtain-pole, about two inches thick and about three feet long. We are going to wrap our brown paper round this so as to make a tube.

When we have got this curtain-pole, and three or four large sheets of good brown paper that can be bought at any stationer's, we are ready to begin. We lay the paper out on a table and make it slightly damp with a sponge. It must not be made really wet, but only just damp enough for all the creases to come out. Now we make some glue with plenty of water. It should not be any thicker than the gum that is sold in shops.

When this is ready, we take one sheet of the brown paper and wrap it once round the curtain-pole. Then, holding it so that it cannot slip, we spread some glue on the paper with a big brush and roll it round the pole bit by bit, until all the paper covered with glue has been rolled up. One or two more sheets should be stuck over the first in the same way, and then the pole, with the thick coat of paper round it, must be put away to dry.

Next morning we shall find that we can pull the curtain-pole out of the paper, and then we shall have a long tube of strong and thick cardboard that will look very neat and smooth, because the paper has shrunk a little in drying, and so there are no creases. The glue will have made it almost as hard as wood.

Now we must go to an optician's shop and buy the lenses. Of course, telescope lenses are made in all sizes, and we must explain exactly what we want. We shall need two one big one, and one little one for the eye-piece. For 5s. 6d. we can buy them both. These will magnify enough for us to see some of the larger features of the moon, but, if we want to see more, then we must pay more

money for the lenses. Very strong ones, that would show all the mountains and valleys splendidly, can be bought for about 30s. or £2.

The optician will tell us "the focus" of the lens we buy. If he says it is 30 inches, he means that the cardboard tube we have made must be cut to 30 inches in length. If the lens is 24 inches focus, then our tube must be only 24 inches long.

When we have bought the lenses we must fit them into the tube with cardboard. First, we take the big one. Perhaps we shall find that it exactly fits into our two-inch tube, but, if it should be a little too small, we must line one

end of the tube with more brown paper until it fits. Now we cut two strips of thick cardboard about one inch wide, and just long enough to go once round the inside of

the tube. One of these little hoops of cardboard must be glued into the tube about three inches from the end. When that has stuck nicely, the lens is put in so that it rests against the edges of the cardboard hoop.

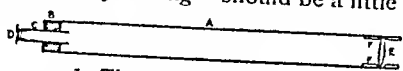
The other strip of cardboard must now be wound round inside the tube, and pressed against the lens. This will hold the glass in position. It should not be glued in, as sometimes it is necessary to take the lens out to clean it. Now we must make a smaller tube

for the eye-piece at the other end. This small tube is made exactly like the big one, but this time we shall wrap our brown paper round a stick that is just as thick as the diameter of the eye-piece. When the tube is made, the eye-piece is fixed in, like the big lens, with cardboard, but closer to the end of the tube. Then we cut a round piece of wood about as big as a penny, and drill a very small hole in the centre. This is to be glued at the end of the tube, as shown in the illustration. Now we have only to fix the small tube and the big tube together. We saw off a piece of the curtain-pole, about one inch and a half long. Then, with a brace and a centre-bit, or an augur-bit, we must

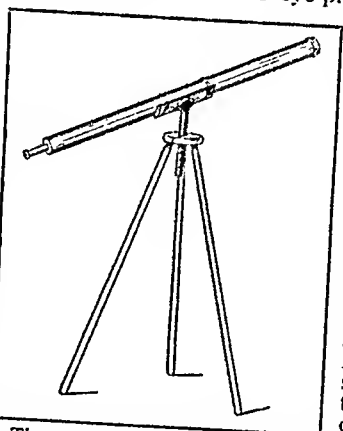
bore a hole large enough for the small tube to slide through. Then the piece of curtain-pole is put in the hole, and our telescope is ready.

When night comes we can point it at the moon. At first we shall see nothing but a blur of light; but if we draw the small tube backwards or forwards very gently, we shall find the correct position, and then, suddenly, we shall see the mountains of the moon.

A tripod stand, exactly like the one shown in the illustration, can be made out of three broomsticks very easily, and this will hold the telescope quite steadily in any position.



1 The cardboard telescope  
A Cardboard tube B Piece of curtain pole  
C Small cardboard tube for eye-piece D Eye-piece  
E Object lens F Cardboard support for lens



2 The cardboard telescope complete on tripod stand made of three broomsticks

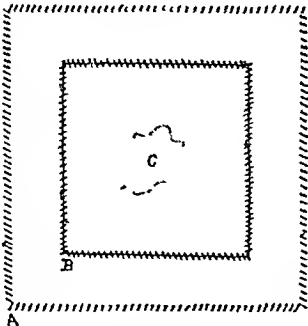


with fine warp darning stitches, but a three-cornered or jagged slit is more difficult to treat. The method depends on the nature of the tear, sometimes a patch may be necessary. If the material be striped, the edges can be placed together and run on the wrong side. In doing this we slope the running to a point at both ends. Such a little seam is only possible when the stripes are narrow and close together. In the case of a three-cornered tear, we may darn the edges together, using either No. 60 cotton or fine silk, according to the material. No loops are left at the ends as in stocking darning, and the darn is fine drawn with very fine stitches placed close together, so that they are hardly visible to the eye.

A three-cornered tear is often successfully treated by hemming a patch on the back of the material with very fine stitches, and tucking in the frayed edge of the tear with the needle just enough to allow the edge to be hemmed down with fine stitches on the right side. The hems must be quite close together, or the patch will show through. A clean tear in a woollen garment may be mended in fish-bone stitch, as shown in picture 2.

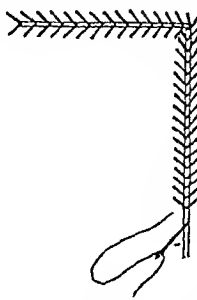
#### GLOVE MENDING

How long gloves would last if those dreadful holes did not come as it were by magic! Whatever they are made of, sooner or later the finger-nails wear holes through the gloves and the seams become unstitched, even new kid gloves have a way of splitting at the thumb-seam. Let us see how to repair these disasters.



2 Patching

A common fault in glove mending is the use of too coarse a cotton or silk. We should choose quite a fine kind and use a small needle. Then, when the seam of a kid glove splits, it is easy to make the same little stitches as the glove-maker did before. In mending holes in cotton or silk materials, it is best to put the finger of the glove with the hole in it upon the first finger of the left hand, and fine draw



3 Fish-bone stitch

the hole. As the hole is usually close to the seam at the tip, we can use the material turned under at the seam, to make a foundation for the tiny darn. We must fasten off the thread on the wrong side, or we shall get that unsightly thread popping out of the finger-ends like a jack-in-the-box. A tear is more trouble-

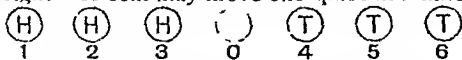
some to repair, and this usually comes in a new pair of kid gloves, the skin of which has become rotten, or has a thin, weak spot. If the glove be longer than is really necessary, we can cut off a little strip at the sleeve end, shape a piece to fit in the tear, and stitch in the patch in the same way as the seams are sewn. Sometimes a little strip of silk ribbon of the same colour as the glove can be used to fill the hole in a similar way, or the hole may be stitched across. The fewer punctures of the kid with the needle the better. Drawing the two edges close together usually makes matters worse, for the kid is likely to tear in a fresh place, although sometimes the edges may be button-holed and then drawn neatly together.

## PROBLEMS WITH PENNIES

A good deal of amusement may be got out of a handful of coppers, and below we give three good problems with pennies.

#### 1 CHANGING SIDES

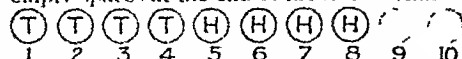
We have six coins, three heads on the left, then an empty space, then three tails on the right. A coin may move one space at a time



into the empty space next to it, or it may jump over the next coin into the empty space beyond that coin. But heads must always move to the right, and tails to the left, no coin is to be moved backwards. The puzzle is to get the heads into the positions 4, 5, 6, and the tails into the positions 1, 2, 3.

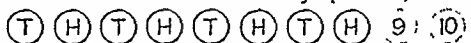
#### 2 HEADS AND TAILS

Again, arrange eight coins in a line, but this time put the first four tail uppermost, and the last four head uppermost. Imagine two empty spaces at the end of the line. Thus:



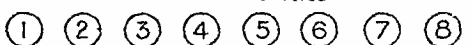
Now, the task is to move any pair of neighbouring coins into the empty spaces 9, 10;

then any pair of neighbouring coins into the empty spaces left by the first pair, and so on, but the final result is to get the coins in a line with heads and tails alternately upwards, thus:



#### 3 PAIRING THE PENNIES

Place eight coins in a line on the table. The problem is, by moving one coin on to the top of another, to have the coins arranged in four pairs. But when a coin is moved it must pass over two other coins, and no coin must be moved more than once.



Thus, suppose these are the eight coins. We may, if we like, put number 6 on to number 3, because it then moves over the coins 4 and 5. Next, we may put number 4 on to number 8, because it then moves over the coins 5 and 7. And so on, remembering that an empty space is not a coin, and that two coins lying one on the other must be counted as two.

The answers to these problems with pennies are given on page 3826 of this book.



# A LITTLE VEGETABLE GARDEN

## WHAT TO DO IN THE MIDDLE OF JULY

JULY is the least busy month in the summer, although we may still plant out our young vegetables, such as cabbages, cauliflowers, and celery. Last month we spoke of strawberry runners, all that are not required for future plants should be cut off as they appear. A good watering may be given to the raspberry canes, should the weather be hot and dry, and especially if no mulch has been given them. A mulch, of course, is a top dressing, consisting of stable manure, mown grass, or even soil and it helps to keep the soil moist. Raspberries are thirsty things when the fruit is forming, so that, in dry weather, either the mulch or plentiful watering is helpful.

There is something we may do for the rhubarb during the summer. We may remove the great white flower, and cut down the stem that bears it. The flower takes to itself far too much of the health and strength of the plant, in fact, we need not wait until it has grown up and expanded, but may cut it out while still close to the ground.

We must give our celery plants good supplies of water during hot, dry weather, if the soil is very light and parched, though on heavier soil, one that retains the moisture, it will not be so necessary. In its native haunts the celery is a semi-aquatic—that is to say, a water-loving plant, growing close beside water—a true aquatic of course, grows in the water. It is always well to find out all we can about plants in which we are interested, and to know that the celery is a semi-aquatic is quite enough to tell us it should never be allowed to lack water.

It has been mentioned a good many times that it is a good plan to keep the soil loose between the plants of growing crops, and, with a hoe and a little fork, we should stir up the surface for a couple of inches or so.

Of course, the gardener has many enemies. Our plants may be attacked by disease, or they may be destroyed, or partially destroyed, by insect pests. There are caterpillars, slugs, and wireworms, to mention but a few. Soot is generally distasteful to these, and, if the insects abound, it should be used freely. Sometimes, for instance, a gooseberry bush

will have its leaves terribly destroyed by the gooseberry caterpillar, and for this dry lime, to sprinkle over the bushes, is recommended. We must not look upon worms as enemies; for they are of the greatest use in the soil, they work their way about in it, and are continually bringing up soil from a depth to the surface, thus acting as Nature's tillers of the soil in helping to keep it porous.

We have spoken of disease. Let us say a word about one that must be familiar to us all—mildew. Among other things, this may be caused by too much moisture. An effective remedy is a pennyworth of powdered sulphur, mixed with an equal quantity of dry lime, sprinkled well over the affected part. Roses are very liable to mildew, especially where they are rather closely enclosed and cannot get enough light and air.

We must take great care of our dahlias at this stage of their growth, which means that we must stake them as soon as they require it, tie them to the stake, and then, as they grow taller, tie them yet again—of course, higher up. They must be made quite firm, or a sudden storm of wind and heavy rain may work havoc among them, as the stems are so exceedingly brittle. We shall do well to thin out the shoots, and if earwigs prove troublesome, we may place a flower-pot inverted upon the stake, after having put into it a little wisp of hay, or dry grass, or even paper or shavings, which serves as a trap.

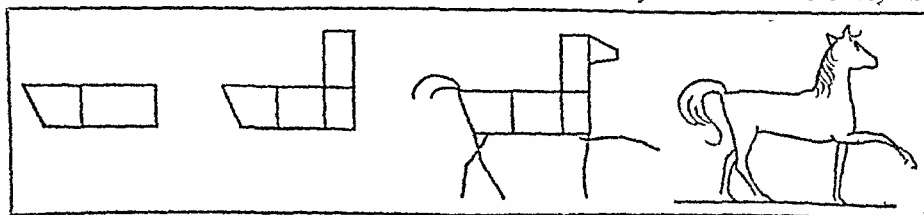
All dead flowers, from all kinds of our plants, should be removed at once—as they fade, in fact—so as to prevent seed forming, for this very quickly exhausts the plants.

If we have a little collection of pot plants, either window plants or plants that we keep in the greenhouse, there will, perhaps, be among them some of a woody nature, such as azaleas, genistas, fuchsias, coronillas, deutzias. Now, these all require to have their growths thoroughly ripened, if they are to flower well next season, and to ripen the growths they need as much air and sunshine as they can get. We ought to stand the pots on a layer of ashes out of doors in a sunny spot, and water as often as necessary. The azalea should be placed in a more sunless position.

## A SIMPLE WAY OF DRAWING A SPIRITED HORSE

HERE is an example of the way in which we can draw a spirited horse with ease. On

We begin by drawing the figure on the left, then we carefully add the other necessary lines



page 975 of this book we read of the way in which we can draw other pictures of this kind

and rub out with eraser all the lines that cut through the body, and our horse is complete.

THESE THINGS TO MAKE AND THINGS TO DO BEYOND PAGE 319

# THE GLORY OF THE FLOWERS IN GARDEN, FIELD, AND WOOD

The world would be a dark place without its flowers. From the tiny flowers not noticed to the tall and stately flowers that lift their heads above the trees, and the blazing sunflowers that have every flower of a different color and perfume, and singly or massed together with flowers of all colors, it is a fact that no garden, field, or wood is complete without them. The flowers of the garden, the green use and the wood, we see them in all the seasons of the year.



A FIELD OF TULIPS. MAY PHOTOGRAPHED IN REGENT'S PARK, LONDON



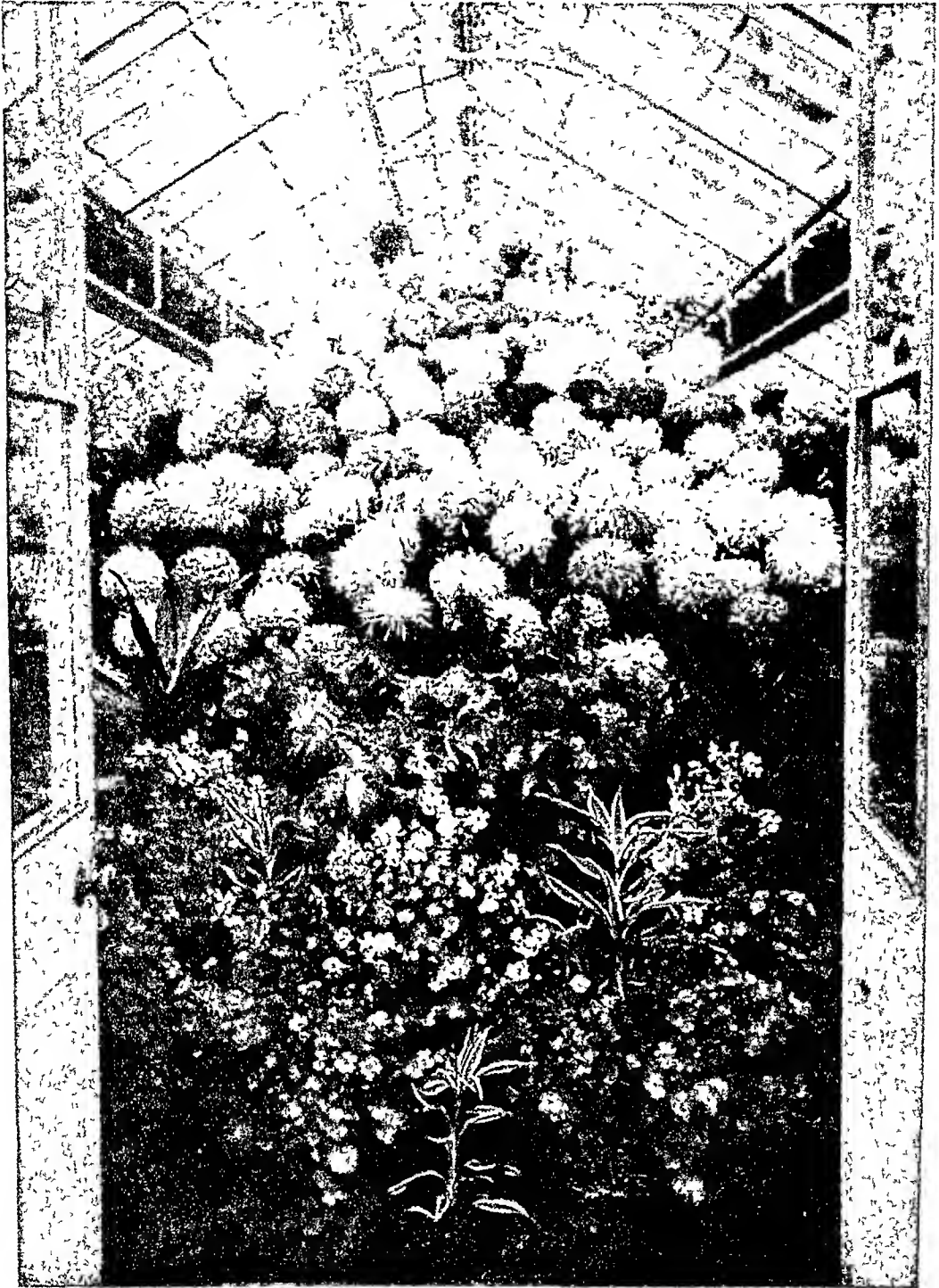




THE WILD FLOWERS OF THE FIELD, THE WAYSIDE, THE WOODLAND, AND THE LAKE



# CHRYSANTHEMUMS IN THEIR NATURAL COLOURS



THE STRIKING BEAUTY OF THE CHRYSANTHEMUM AS SEEN IN A GREENHOUSE

# The Child's Book of NATURE

## PLANT LIFE

WE have read the story of Animal Life, and we come now to the other great division of living things—Plant Life. Nothing is more wonderful than the flowers and plants that grow everywhere filling the air with sweetness and making the earth beautiful to look upon. The story of the flowers is a story that never ends—we can never tell half of the wonderful things that are to be told about them. Some flowers are so small that we do not see them. The wind, the birds, and the beasts carry the seeds over the earth and we can never grow tired of learning about the ways in which the flowers spread themselves. Some flowers throw up their seeds for the wind to catch and blow away and all flowers have a wonderful cleverness in spreading themselves over the world. We read in this part of our book about the beautiful way in which Nature does her work, and we learn the story of the familiar flowers and plants of the garden and the countryside that delight us so.

## HOW A FLOWER IS BORN

### WHAT NATURE DOES TO KEEP THE PLANTS ALIVE

WHAT is a plant?

That is a question not easy to answer without using many strange words—but in most cases it is perfectly easy to tell a plant from an animal or a mineral.

If we were to see a rose tree, a dog, and a stone we should be able to tell at once that the rose tree is a plant, the dog an animal, and the stone a mineral. But there are some plants that we might think were just stones on the rocks. There are some others very small that we might think were animals. If we saw them moving through the water and there are some kinds of animals that we might think were plants.

Many years ago we were taught that animals and plants differ from stones because they live, and that an animal differs from a plant because it feels. To-day we know that many plants can feel. The plant is a living thing. It has no limbs, no feet, no wings yet it can move, and some plants can take hold and climb. It is a wonder yet it can tell its own life. Some plants can even catch and feel their insects. The plant can make food, and sugar and fat, and many other things out of air, water and light, and it has its own life within it.

There are many kinds of plants of different sizes and lives. There are trees, shrubs, vegetables, grass, ferns, mosses, and mushrooms. They are all plants of different kinds.

BY EDWARD STEPHENSON



Let us talk a little about all these kinds of plants and see

how they get their living.

We ought all to know the great work the plants are doing for us. They make the lovely

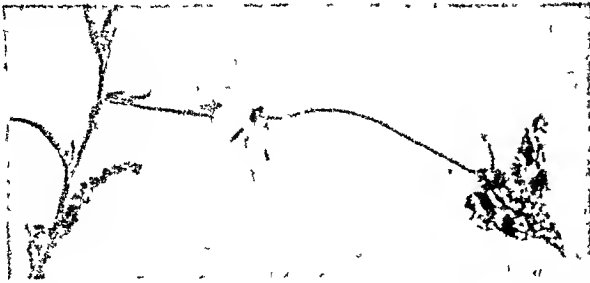
flowers we are so pleased to look at and to gather when we walk in the country lanes. But that is a very small part of the work they do for us. They give us nearly all our food and much of our clothing. They give us pure air and indeed we could not live if there were no plants. Think what the world would be like without plants! I am sure we should say that it was a strange and dull world.

Before plants appeared upon the earth the world must have been just a great ball of bare solid rock with the sea and rivers in the hollows, and in the waters there may have been seaweed. At first the only plants were mosses and lichens could grow on the rocks and along the sea-shore where the waves in great stones had broken off pieces of rock and brought them to the shore.

Herbs and shrubs and trees came next in which the plants began to be really the plants that we know. If a plant grows in the soil it can take food from the soil and water from the soil. But some plants can take food from the air and water from the soil. The plants that grow in the soil are called the plants that grow in the soil. The plants that grow in the air are called the plants that grow in the air. The plants that grow in the water are called the plants that grow in the water. The plants that grow in the soil and take food from the soil are called the plants that grow in the soil. The plants that grow in the air and take food from the air are called the plants that grow in the air. The plants that grow in the water and take food from the water are called the plants that grow in the water.

If we go out in winter, when there is a great deal of damp about, we

grow again. Of course, some of them die from old age, and then bodies decay.



Insects carry pollen, a yellowish flower dust, from flower to flower, and it is this dust that makes the seeds form. Here we see a moth with a long tongue, on which it carries pollen to a tobacco plant. Without this the plant could not give birth to other plants.

The wind also carries the seeds of mosses, and leaves some of them on such damp patches, where they grow. The lower parts of the mosses die, and make more mould. Then the living mosses on the top catch dust from the air, and with it come the seeds of ferns and other small plants, which now find mould deep enough to root in. Their roots find their way into chunks of the rock, and as they grow thicker they are strong enough to break

shall notice patches of bright green on old fences and trees. This is made

up the surface of the rock. In time, we shall see, there will be a sufficient depth

up of hundreds of thousands of tiny plants, so small that if we could place 3,000 of them in a row, so that they touched one another, the whole row would only just about reach across a halfpenny. Let us examine the small dot over this. That dot, small as it is, is many times larger than one of these tiny plants, which have no roots, no stems, and no leaves or flowers.

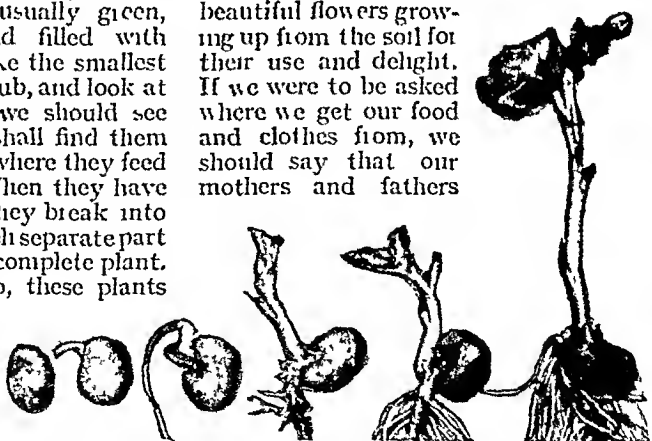


The seed of the Sand Box grows inside a skin, which bursts when ripe, and scatters the seeds.

of mould for shrubs and trees, whose seeds may be carried far away by the wind, or dropped in distant places by birds as they travel on their annual flights from land to land. In this way the plants slowly covered up the bare rocks with their growth, and made it a place where insects and birds and grass-eating beasts could live. And after many, many years, men and women and children

Each plant is, in appearance, just like a little round bubble, usually green, but sometimes red, and filled with fluid. If we were to take the smallest drop out of a rain-water tub, and look at it under a microscope, we should see hundreds of them. We shall find them in almost any little pool, where they feed upon the rain-water. When they have grown to their full size they break into two or more parts, and each separate part becomes round, and is a complete plant. When the pool dries up, these plants dry into a little dust, and the wind takes it through the air, and some of it sticks wherever the wind passes over a damp surface. Then the little dried-up plants soak up the moisture and begin to

lived there, and found food and fruit and beautiful flowers growing up from the soil for their use and delight. If we were to be asked where we get our food and clothes from, we should say that our mothers and fathers



Seeds are wonderful things. Each one contains a baby plant, with a root, a shoot, and a pair of fat leaves. When a bean-seed begins to grow it splits up its jacket, and a little white shoot pushes out into the ground. That is the root. Then the seed-leaves fall apart, leaving the plant to grow as shown in the photograph.



young ones may be able to grow up under the shelter of the parent plants. Now, these seeds are all very wonderful things. Each one of them contains a baby plant with a root and a shoot and a pair of fat leaves. These seed-leaves are fat, because they are the pockets of the little plant, whose mother, before sending her baby plant away, has filled its pockets with enough food to feed it until it has got its root firmly fixed in the ground, and its shoot growing up to the sun.

If we soak a bean-seed in water for a day, then lay it on moist earth in a flower-pot, and put it in a warm place, this is what will happen. The bean will soon begin to grow, and the first sign that it is growing will be the splitting up of its jacket, which has become too small for it. As the slit widens we shall be able to see that a plant that the real seed inside is in halves, joined together in only one small place. These halves are the bean's pockets filled with food, and between lies the baby plant. In a few days a little white shoot pushes out, and as it grows longer its pointed tip bends to the mould and pushes into it. That is the baby bean's root. When it is far enough in to get a good hold of the soil, it lifts up the bean, which had been lying on its side. Then the fat seed-leaves fall apart, and in between them we see a pair of very tiny leaves with their edges folded together. These little leaves grow very fast, and are soon as big as one's hand, and as they grow large the fat seed-leaves get small and wither. We see that the baby bean is eating up its food and its pockets are getting empty. But now it has got those large green leaves it will be able to work for itself, and get all the food it wants from the mould and the air. And that is how the mother plant sends her baby away—always with enough food to last until it is big enough to get its own living.

Now that we have seen what a seed really is, let us have a short talk about how seeds are formed. We must know that the great object of every plant is

to be able to ripen seeds, in order that the race may not die out. To ripen seeds the plant must first have flowers, and the plant's sole excuse for devoting so much of its energy and substance to the making of showy blossoms is that it must, at any cost, produce seeds.

Many plants, such as we call annuals and biennials, because they come up every year or every two years, ripen their seeds and then die. They have given their lives to this effort, and, the work being done, they die.

If we were asked which part of a flower we thought of most value, we should almost certainly point to the brightly coloured petals, and say "These!" But we should be wrong.

The petals are of great value to the plant, and it pours its richest colours into them to make them as bright and showy as it can. Yet there are some flowers that have no petals. The most important parts of a flower are the green and yellow parts and threads in the centre; the parts that are often hidden by folds of the petals, the parts that some people think a fault when they appear in double garden flowers. Where there are bright petals they do not exist solely to make us pleased with the flower,



This plant, called the Venus Fly-trap, opens its leaves to tempt insects inside and then closes them and traps the insect to its death.

but in order that insects shall be able to see the flower from a distance, and come to it, to help the plant to form its seeds. To induce the insects to come, many flowers are fitted with little glands that pour out from their surface a sweet fluid called nectar, and they also give out a sweet scent, which bees, butterflies, and moths look upon as a notice that sips of nectar may be had, free of cost, if they will follow up this scent to the bright-hued flower. The flowers that do not want the aid of the insects have small shabby petals, or no petals at all. Now, the plant that wishes the bee, the moth, or the butterfly to come to the flower, takes care that this nectar shall not be got at by ants, or beetles, or common flies, and all kinds of tricks have been learned by the plant to guard its nectar.

# HOW FLOWERS INVITE THEIR LITTLE GUESTS



If we look at this picture of the bee visiting the flower, we shall see the plate and threads standing out from the mouth of the trumpet-shaped blossom.



This is a picture of apple blossom. The apple does not like the butterfly and in its marginal structure the insect and gives them access to the fruit.



Flowers have many ways of attracting insects. Some have a strong scent, some have a bright color, some have a shape that is attractive to insects. Some have a long tube that the insect must enter to reach the nectar. Some have a long tube that the insect must enter to reach the nectar. Some have a long tube that the insect must enter to reach the nectar. Some have a long tube that the insect must enter to reach the nectar.





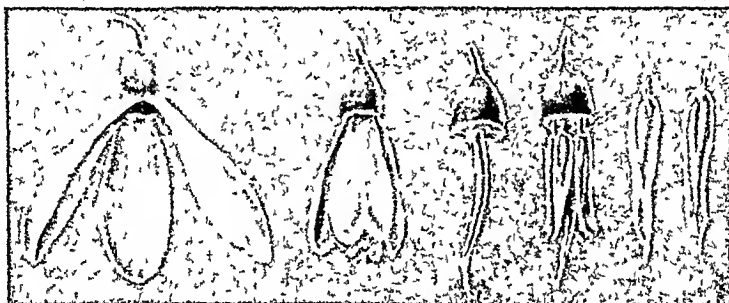
from such robbers. The columbine and the garden nasturtiums have long, hollow tails, and the nectar is poured out at the bottom of these, so that only insects with long, thin tongues can reach it. The honeysuckle has long, trumpet-shaped flowers with nectar at the bottom.

But moths and butterflies have their tongues grown into long, hollow tubes like the trunk of an elephant, and they can reach the nectar with ease. On the other hand, there are many plants that do not want bees or butterflies, preferring the visits of beetles and flies. These spread their nectar on flat, open parts of the flower where these short-tongued insects can lick it up. But the long-tongued insects are not too proud at times to take a drink at these flowers. The ivy has flowers of this kind, and

We have not yet learnt *why* the flowers are so anxious for these insects to come that it is worth their while to attract them by bright petals and sweet scents, and then to reward them with nectar. If we look at the honeysuckle we shall see the pins and threads standing far out from the mouth of the trumpet. There are six of these to each trumpet, and one is different from the others. Five are shaped like hammers with very long handles; the sixth is without the hammer-head, and ends in a little sticky knob like the head of a pin. If we pull the flower to pieces carefully, splitting the trumpet down the middle, so that we can see the bottom of it, we shall find that this long pin ends in a rounded green knob below the thin end of the trumpet. Inside this knob

are many little white specks. The knob and the thread together are called the *pistil*.

The five hammer-heads are *stamens*. They split open and give out a mealy, yellow powder called *pollen*. If a grain of pollen is placed on the sticky end of the pistil, the pollen sends out a shoot which pierces



SEPALS

PETALS

PISTIL

STAMENS

These are the parts of simple flowers, such as the snowdrop. The snowdrop's bud hangs down and the white part splits into three sepals. The sepals spread out their tips and show us three petals inside. In the centre is a sort of pin called the pistil, with the seeds packed in the knob of the stalk, and around the pistil are six slender stamens, shown here attached and also loose, inside and out.

in autumn, along hedges where the ivy grows, we may see swarms of blue-bottles, greenbottles, bees, and butterflies, all crowding around the flat dishes on which the ivy has spread her nectar.

Flowers like those of the carrot spread their nectar on flat plates for the beetles and flies, so the butterflies pass them by as being too much like a fox's feast. Some plants, like the buttercups and marsh marigold, seem to say to insects in general that all will be welcome, for the nectar is held in little cups, in open flowers, where all can get at it without trouble. Some plants, like the foxglove, have so adapted their flowers to the shape and size of the humble-bee that no other insect can get at the nectar, for though it seems easy for small creeping insects to crawl into the large bell, their way is blocked by stiff hairs that are easily pushed aside by the strong bee.

the pistil and finds its way right down to a little white speck in the knob, and pierces that also. Then a strange thing happens. The white speck begins to grow, the knob grows larger, and the trumpet drops off. The green knob becomes a juicy red berry and the white specks become seeds. But unless the pollen gets on the tip of the pistil there will be no seed.

In most of the brightly coloured flowers the stamens and the pistil ripen on different days, or else the stamens are so placed that the pollen cannot fall on the pistil of the same flower. That is because these flowers cannot grow seeds from their own pollen. The insects fly to these bright flowers, and as they fly they pick up pollen on their hairy bodies and rub against the sticky pistils, leaving a little behind.

The next story of Plant Life is on 3527



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We have nothing even nearly resembling the "Marseillaise" among our own songs "God Save the King," about the origin and authorship of which nobody is really certain, is almost tame by comparison with the fiery French strain Unless it be "Boyne Water," we do not get excited about any English song, and it is only Irishmen who are apt to get a little warm over *that*, because it reminds them of the battle on the banks of the Boyne, fought in 1690, when William III defeated James II.

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But we have "Rule, Britannia," a grand song which Southey, the poet, said would be the battle-hymn of England so long as England maintained her political power. It is a pity we should not be able to say with absolute certainty to whom we owe this stirring piece. The difficulty arises in this way "Rule, Britannia" appeared first in a sort of stage-play, written in 1740 to commemorate the accession of George I. The authors of the play were James Thomson, the poet of "The Seasons," and David Mallet, and, unfortunately, they did not show, by putting their names to them, just which parts of the play they had each written. Thomson died in 1748, before "Rule, Britannia" became very popular, so he had no special reason for claiming it for himself, supposing it were his.

But experts who have looked into the matter generally give him the honour, and we may safely follow them. "Jemmy" Thomson, as they familiarly called him, was not a great poet, but lovers of Nature and the open air still like to read his book "The Seasons." He took life so easily—so indolently, we should say—that he could often be seen standing in his garden at Richmond, Surrey, eating the peaches off the trees, with his hands in his pockets.

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After him we may mention his brother Scot, Thomas Campbell, considered a great poet in his day. He was a Glasgow man, born in 1777, and he wrote his once popular "Pleasures of Hope" when he was only twenty-one.

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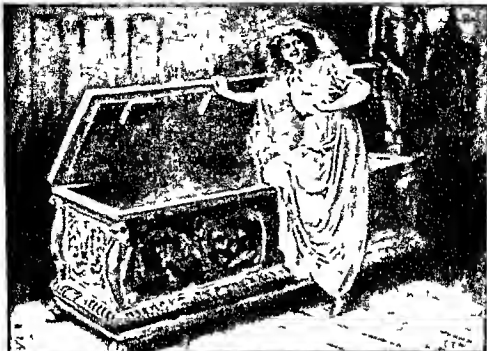
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#### A WRITER OF SEA-SONGS WHO KNEW A LITTLE OF SAILORS OR THE SEA

Dibdin had very little personal acquaintance with either sailors or the sea, but up to his time the British tar had not received much attention in song, and, as Dibdin had a great liking for the plain, manly, honest, patriotic character of the British tar, he resolved to make verses about him. His songs had a real practical effect, for they moved to heroic deeds thousands of England's sailors, besides warming their hearts in hours of merriment, and lightening their dreary hours when prisoners in the hands of the enemy. Poor Dibdin had rather a hard life, but the Government, in his later days, gave him a pension for his sea-songs. He died in 1814, at the age of sixty-nine, and was buried in St Martin's Cemetery, Camden Town, where the late Lady Rosebery unveiled a memorial to him in 1888.

Of course, there were other writers of sea-songs besides Dibdin. We think of David Garrick chiefly as a great actor, but it was David Garrick who wrote that grand patriotic song, "Hearts of Oak." He wrote it under the inspiration of that wonderful year, 1759, of which it makes mention—the year of Quiberon and Quebec and Minden, when the British arms were covered

## PICTURE-STORIES OF TWO FAMOUS SONGS



We all know the old story of The Mistletoe Bough, the song that has been played by the  
 Christmas-tide. The bride of Lord Lovel, on her wedding night, had for tea in a big oak hall, but the  
 lid closed down and the ring lock fastened her in. Many a later he who loved her found her to be his.



Another famous song with the story of Lord Lovel, who was married by Lady Anne, delivery  
 to the same story as the old song. The story of the song with the same old name as the old story, a standard story,  
 when Lady Anne was the bride and her husband. The story is a story about a man who was married to a woman who was the daughter of a nobleman.

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Mr Andrew Lang says it is like listening in the sad yellow evening to the strains of a barrel organ faint and sweet and far away. And so it is. Baily could play beautifully with old romance and in that direction song has nothing more effective to show us than *The Mistletoe Bough*. When the lute got into the ancient chest

It closed with a prong And drew it  
down!

The lute lay clasped in her living  
tomb

so that her lover mourned for his  
fury bride and never discovered the  
whereabouts of her premature tomb.

**SOME FAMOUS SONGS THAT WERE  
WRITTEN ABOUT REAL PEOPLE**

It is said that such an incident once  
really happened. And that may serve  
to remind us that famous songs have  
often been made about real people.  
There is *Annie Laurie* for instance.  
Few of us probably think of *Annie  
Laurie* as having existed in real life.  
But she did. If we go to Dunfermline to-  
day we may see her. Last will and  
testament in one of the institutions  
there. We know that the song is by

Maxwellton. Traces are known and  
Maxwellton is near Dunfermline. When  
*Annie Laurie* was born at Maxwellton  
in December 1843 and today she is  
at rest in Dunfermline churchyard at  
which Carlyle often visited and writes  
for her tombstone that it is

Now the *Annie Laurie* has  
been a certain Mr. Duns. And it  
was he who made the song of the  
song, and it is. But this song is  
very real. It is the one that  
about twenty years ago. It is the  
song that is the best of the  
the song that is the best of the  
the song that is the best of the

it for a bazaar held on behalf of the  
widows and orphans of soldiers who had  
been killed in the Crimea and it was  
soon taken up and sung everywhere.

**A FAMOUS SONG THAT WAS WRITTEN BY  
A FARMER'S SON IN TEN MINUTES**

Then there is *My Pretty Jane*, a  
song which that great tenor Mr. Sims  
has made immortal by his splendid  
rendering of it. This song was written  
by Edward Fitzball, a farmer's son who  
used to wander about the lanes of  
Burwell, a little village some eleven  
miles from Cambridge. Near one of  
these lanes a farmer did dwell as  
the song says. He had a daughter and  
she was the pretty Jane. Jane had  
a bewitching manner and Fitzball  
fell madly in love with her.

One morning he sat down in his father's  
field when the sun was on the eye  
and wrote this song in ten minutes.  
Later on he gave the words to Sir  
Henry Fothergill, the man who composed  
the tune for *Home Sweet Home*,  
and Fitzball produced the melody which  
has literally gone round the world. It  
is said to have to add that *My pretty  
Jane* died of consumption in the  
height of her youth and beauty.

The *Lass of Richmond Hill* too  
was a real person. So we tell us that  
she belonged to the hotel and in Surrey,  
perhaps because there is one of the  
public houses there called *The Lass  
of Richmond Hill*. But she was the  
daughter of a King's Bench solicitor  
who had a place called *Hill House*  
in Richmond. And that her name  
was *Elizabeth Brown*. She married  
*Thomas MacNally*, an Irish turner,  
and it was he who wrote the  
song. It is the only ballad which has  
been written about a real person.  
It is in *ROYAL BALLADS*.

So another real person was *Henry  
Care*, a sailor in the Navy. So  
we have a song about a sailor who  
had gone out to sea and was  
swept out to sea. It is the  
song that is the best of the  
the song that is the best of the  
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with glory by Lord Hawke and General Wolfe and the Marquis of Granby. We know all about Garrick, but we know very little about the man who gave us that other familiar sea-song, "Ben Bolt." His name was Thomas Dunn English. He was an American, a life-long friend of Edgar Allan Poe, the author of "The Raven," and he died so recently as 1902.

Then we ought to mention Andrew Cherry, who wrote "The Bay of Biscay," and also the best song that we have about "The dear little Shamrock of Ireland." Cherry was the son of a Limerick bookseller. He took to the stage, and appeared, with much applause, as the newspapers said, at Drury Lane Theatre in 1802, ten years before his death. Nor must we forget Samuel J. Arnold, who provided us with "The Death of Nelson," one of our greatest national songs. Arnold was very fond of sea-subjects, and wrote another once popular song, "Speed on, my Bark, speed on." He was a son of Dr. Arnold, the famous composer.

**A SONG THAT WAS SUNG AGAIN & AGAIN  
TILL THE SINGER COULD SING NO MORE**

"The Death of Nelson" appeared in an opera produced in London not very long after the great admiral's death. Braham, the great tenor, who once sold pencils in the street, had written the music, and it was he who sang it first. The enthusiasm was tremendous. Nelson had been the nation's hero, and this song about him had to be repeated again and again, until Braham was in a state of collapse. Among the sea-songs we must not forget "Rocked in the Cradle of the Deep." It was written by Mrs. Willard, an American, but we should probably never have heard of it had not a clergyman, the Rev. Joseph Knight, made for it the fine tune that we know so well.

But we must think of our soldiers as well as of our sailors. To be sure, there are not so many songs about soldiers as about sailors, perhaps because there is less romance about life on land than about life at sea. But we have "The British Grenadiers," a song about which we know nothing more than this, that the words date from about 1690, and that the tune comes down from the sixteenth century. And then we have the favourite, "The Girl I left behind Me," which may be regarded as the

property of both soldiers and sailors. It has been played for a century or more when a man-of-war weighs anchor, and when a regiment quits the town in which it has been quartered, consequently it has been made known wherever English soldiers and sailors go.

**SONGS THAT ARE SUNG WHEN THE NATION  
IS REJOICING**

Some of us are old enough to remember the rejoicings that took place over the relief of Ladysmith. Well, in the days of the Crimea our people had similar cause for rejoicing, as it was then that they sang "Cheer, boys, cheer, Sebastopol is taken." That was one of the most popular songs of the day. It was written by Charles Mackay, a Scotsman, who adopted as a daughter the now distinguished novelist, Miss Marie Corelli. But Mackay's words would not have been so popular if a certain Mr. Henry Russell had not set them to catchy music.

Henry Russell was a popular song and story entertainer for many years, and he wrote many songs, both words and music, of his own. We all know his "A Life on the Ocean Wave," and his setting of Dickens' pretty verses about "The Ivy Green." He was a very realistic singer, and moved his audiences strongly. Once he sang a song which he had written about a Newfoundland dog that had bravely leapt overboard from a vessel and saved a drowning child. At the end of the song, a man in the gallery called out, "Mr. Russell, if that dog is yours, I'll give you a sovereign for a pup."

Russell had been fondled on the knees of George IV., but it is only a few years since he died. It is his son, Mr. Clark Russell, who has given us so many interesting and stirring sea-stories.

**SAD SONGS THAT OUR GRANDMOTHERS  
USED TO SING**

Then there was Thomas Haynes Bayly. We do not know his songs so well as our grandfathers and grandmothers used to know them, but we know at least "The Mistletoe Bough," and we have heard of "She wore a Wreath of Roses," and of "Oh, no! We Never Mention Her," of "I'll hang my Harp on a Willow Tree," and of "Gaily the Troubadour touched his Guitar." Bayly was born in the old town of Bath in 1797, and died in 1839, after

years of misfortune. His father was a solicitor and he also wanted his son to become a solicitor. But the youth took a great dislike to the law. The father then tried him with the Church but he did not like that either so at last he joined the ranks of those who looked to literature for a living. There is a fine old flavour about his writing something like what we should experience perhaps if we opened an old bureau and turned over the letters of our grandmothers.

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It is said that such an incident once really happened. And that may serve to remind us that famous sons have often been made about real people. There is Ann Laurie for instance. Few of us probably think of Anne Laurie as having existed in real life. But she did. If we go to Drury to-day, we may see her list with an testament in one of the institutions there. We know that the name is real.

Maxweller boys are better and  
Maxweller is near Dunbar. We  
Miss Louie was born at Maxweller  
in December 1890. A Friday she  
at school is Dunbar class and about  
which I can't find work in school  
for her to be a girl in that class.

Now the American people are  
a certain Mr. Douglas, and it  
was known that the crowd at the  
meeting was full. But the crowd  
very small and as they were sent  
at all events, was a lot of  
So it is a matter of getting the  
for the whole of the day, and  
they are all the same. The crowd  
was all the same. The crowd

it for a barrier held on behalf of the widows and orphans of soldiers who had been killed in the Crimea and it was soon taken up and sung everywhere.

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One morning, he sat down in his father's field when the bloom was on the eye and wrote the song in ten minutes. Later on he gave the words to Sir Henry Bishop the man who composed the tune for Home Sweet Home and Bishop produced the melody which has hit rally gone round the world. It is due to him to add that My father's Joe died of consumption in the last bit of his youth and he is

[illegible][illegible]



So far, we have not noticed any of the lady song-writers. Now, when we come to think of them, it is curious to reflect that they were mostly Scottish women, still more curious to note that two of them, at least, wanted to hide what they had done. There was first Lady Anne Lindsay, who wrote the fine ballad of "Auld Robin Gray," for which Mr. Leves, a Somerset clergyman, made such an exquisite tune. She was one of a family who had long been known for their literary and artistic gifts. Her father was the Earl of Balcarres, and she was born in 1750. Her mother, who was very severe, used to shut her children into dark closets or give them only bread and water when they did anything wrong.

One day the young people decided to rebel and run away. They did run away, but the old shepherd of the place stopped them and brought them back to be punished. Now, the shepherd's name was Robin Gray, and it was the memory of this incident in her young days that made Lady Anne take his name for her song, when she came to write it many years later.

#### HOW PEOPLE TRIED TO DISCOVER THE AUTHOR OF A VERY POPULAR SONG

The song soon became popular, but she had not put her name to it, and people began to ask about the authorship. Indeed, a learned Edinburgh society offered twenty guineas for the name of the writer. This strikes us as very curious nowadays, when we find everybody rather proud of being able to write. But we must remember that people were not so proud of writing a hundred years ago. We all know how Scott wrote the Waverley novels secretly. People occupying a high station in life thought it undignified to write for print. What Lady Lindsay said about it was this. She declared she had a dread of writing anything "because of the shyness it created in those who could write nothing." In other words, she did not want to make people who could not write uncomfortable in her presence.

Another great lady writer of Scottish songs held the same view. This was Lady Nairne, the author of "The Land o' the Leal" and "Caller Herrin'," and a goodly number of songs about Bonnie Prince Charlie and the fight he made

in 1745-1746 for the crown of his fathers. Lady Nairne sent her songs to the publisher under the name of "Mrs. Bogan," and when she went to see him at his office she went disguised.

#### A SONG THAT BROUGHT COMFORT TO A SORROWING MOTHER

She is best known now by "The Land o' the Leal," which was written to console a dear married friend who had lost her first-born child. That is the meaning of the line, "Oor bonnie Bairn's there, John", for the land o' the leal means heaven, and not, as some people think, the country north of the Tweed. Lady Nairne belonged to an old family who had fought and bled for the Stuarts, so it was no wonder that she made so many fine songs about the Jacobites and about the cause which ended so disastrously at Culloden.

But there were other writers of songs about Prince Charlie besides Lady Nairne. There was James Hogg, for instance, better known as the "Ettrick Shepherd"—one of the most wonderful natural geniuses that Scotland ever produced. He got little more than six months' schooling, and he was a man before he could write down the letters of the alphabet correctly, yet he gave us such songs as "Bonnie Prince Charlie," "Flora Macdonald's Lament," "Come o'er the Stream, Charlie," and "When the Kye comes Hame." He was a real shepherd, and lived all his days near that Yarrow of which Wordsworth has written so tenderly. William Glen, a Glasgow merchant, should also be mentioned for his "Wae's Me for Prince Charlie," a song which the late Queen Victoria often asked for when anybody was singing in her presence.

#### THE FAMOUS POET OF IRELAND AND THE BEAUTIFUL SONGS HE WROTE

Of writers of Irish songs which have become famous, quite a number might be mentioned. Perhaps there is nothing more popular than Tom Moore's "Last Rose of Summer," though "Robin Adair," the writer of which we do not know, runs it pretty close. Moore was a perfect master of song-writing, and his "Irish Melodies" included many songs that were once greatly popular. Some, indeed, such as "The Minstrel Boy to the War has Gone" and "The Harp that once thro' Tara's Halls," are still widely known, and are often

heard upon the concert platform. Moore is, without question one of the greatest of our song writers. His sentiments are so beautifully expressed that they appeal not only to the Irish nation but to the whole Anglo-Saxon race. It was Samuel Lover the novelist who gave us "Kory O More" which became so popular that it was played by most bands when Queen Victoria was crowned.

The Wearin o the Green is always in great request at Irish patriotic gatherings. Both the Irish exile and the Irish patriot find their sentiments reflected in it and its vein of melancholy appeal.

the copyright was sold some years ago  
it realised the substantial sum of £600

It was the music of Michael William Balfe that made the song of Killarney written by Mr J. Lakoner known in all English-speaking land. If Balfe had written nothing but this song, and the opera of *The Bohemian Girl*, his name would have been handed down to posterity.

There are many more songs which can be mentioned only briefly such for example as the famous Cherry Ripe the words of which were written by Robert Herrick and the Yeats of Bray.



Henry Caery the poet, who was at one time thought to be the author and composer of "God Save the King" is best known now by his popular song "It's in our Army". Caery was also once after serving London out of the power. I sat out for a holiday with her somewhere, a fern, broad-leafed garden lawn by the stream.

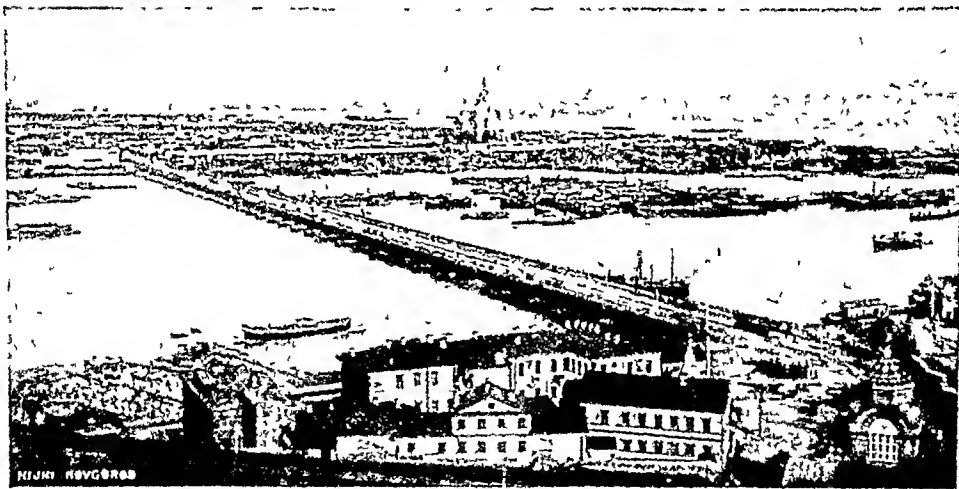
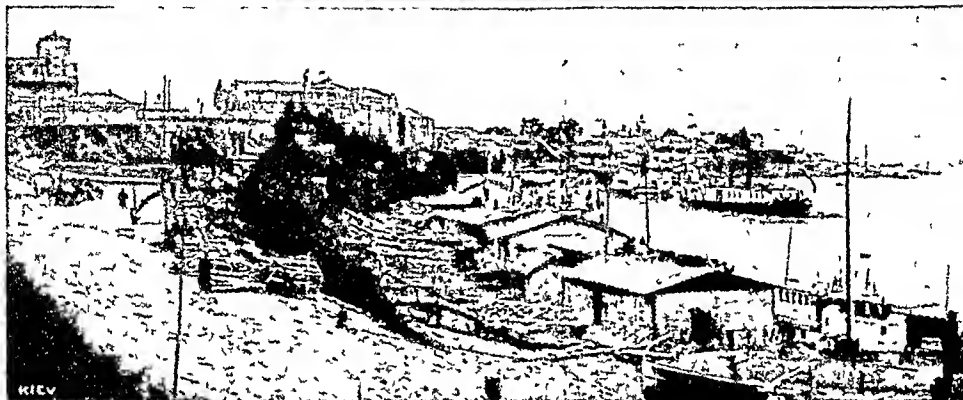
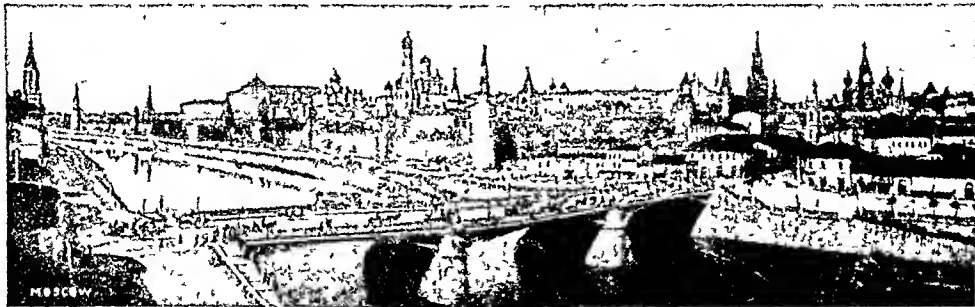
to them. There are many we  
but the favorite one is that written  
I. The great the a for

[illegible]

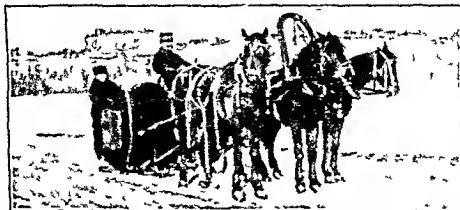
We could cross the Atlantic and  
there land at a better place

[illegible]

# GREAT CITIES OF THE RUSSIAN EMPIRE



Moscow is the ancient capital of the Russian Empire, Kiev is another ancient city, and Warsaw is the old capital of Poland. To the great annual fair at Nijni-Novgorod 400,000 traders bring £24,000,000 worth of goods



# RUSSIA AS IT IS TO-DAY

**M**ORE than half of Europe added to more than one third of Asia or about one sixth part of all the land of the world—such is the size of the dominions of the Czar of all the Russias today!

We have already seen how this vast Eurasian empire has grown through the centuries from some small and states about the Dnieper and Volga rivers till it reached the White Sea, the Baltic Sea and the Black Sea, and across thousands of miles to the Pacific. Let us now with our eyes and pictures before us try to gain some idea of what there is to see in these 8,500,000 square miles of the earth's surface in the country and in the towns and where and how the 140 millions live under the rule of the czar.

[illegible]

to hunt bears  
and furs for their  
furs and use  
draw by teams of

does to travel over the ice and now South of the tundras the rules and times of ferrets spending duskly farther than the eye can see. For the most part these are silent like the av plants though, where tran part is

possible men; either to cut down a dispatch the number which is one of the chief proofs to Russia has to send

[illegible]

sad lives, and are terribly poor. Sometimes famines cause desperate starvation in the land that produces and sells to other countries great quantities of corn. The intense cold, too, also brings much suffering to the poor, for nearly all over Russia, except on the Black Sea Riviera, snow and ice last for months. Some go into the towns to work when nothing can be done in the fields, but, in most cases, the poor creatures paste up every cranny that lets in air to their wretched hovels, light a stove, which is kept going, if possible, night and day, and resign themselves to a wretched existence, often stupefied with a strong spirit called vodka.

Very hard, too, is the lot of the many thousands of miners in Russia. These we shall find about the Ural Mountains—there is an obelisk on one of these with Europe engraved on one side, and Asia on the other—and the Altai, or Gold Mountains, in Siberia, on the borders of China, and on the various coal-fields, chiefly round the important towns of Moscow and Warsaw.

#### THE UNTOLD WEALTH THAT LIES BURIED UNDERGROUND IN RUSSIA

The mineral wealth of Russia is untold, and is not yet half worked, neither does it go to enrich the country nor to help pay for the costly reforms which are so urgently needed. There are iron, copper, gold, and silver among valuable metals, every variety of precious stones, marbles, and agates, and thousands of unhappy beings toil year after year, wresting these minerals from their dark hiding-places in Mother Earth's rich stores. Those who have broken the laws, and, alas! sometimes those who are only suspected of breaking them, are sent—as British convicts used to be sent to Australia—to Siberia, as exiles or prisoners, or to work in the mines.

Others of Russia's millions are to be found by the waters that cover so much of its surface, working and building the steamers and the infinite variety of boats and barges that travel on the rivers, canals, and lakes. Others are engaged in fishing, for fish is extraordinarily plentiful, and is much needed, as there are so many fasts in the Eastern Church, when no flesh food, but only fish, is allowed to be eaten. Russia is not yet a great manufacturing country, although many iron, steel, copper,

and textile works are rapidly growing up; so, at present, we find no districts densely peopled, with towns almost joining each other, as in our own cotton, woollen, iron-working, and ship-building centres. But there are innumerable towns in Russia, most of them very interesting, chiefly situated on the old great river highways, and more are now rising up along the vast new iron highways—the railways—that link up the north and south, and the east and west of the huge empire.

#### THE CITY OF PETER THE GREAT, THAT SEEMS TO FLOAT UPON THE WATERS

It is an easy journey from England to Russia, either by land or sea. One of the chief routes by land is *via* Berlin and Warsaw, taking about three days. If we choose to go by sea, it will take a little longer, even if we shorten it by going through the Kiel Canal, instead of round Denmark to the Baltic, then up the Gulf of Finland, past Kronstadt, the great arsenal and sentinel of the Neva, to the city of Peter the Great, the capital of the empire, built on the islands and shores of the Neva, as it winds into the Gulf of Finland.

If we mount the dome of St Isaac's Cathedral, near the centre of St Petersburg, and look down on the mass of glittering water in the canals and arms of the Neva, the city seems as if almost floating upon it. The edges are lined with fine quays and docks, and barges and steamers and boats of all kinds ply busily about in every direction, for St Petersburg is connected by water with the distant Black, White, and Caspian seas. But if our visit is in winter, a very different scene meets our eyes. All is frozen—the Gulf of Finland, the rivers, the canals, and the lakes.

#### THE SLEIGHS WITH THE TINKLING BELLS THAT RUSH OVER THE FROZEN LAKES

The ice is strong enough to bear carriages of every description, and rich folk, wrapped up to the eyes in costly furs, glide swiftly along in sleighs, sometimes with three horses abreast, tinkling their bells, over the ice and snow, to enjoy all the balls and theatres and parties of the gay winter season. French is greatly spoken by the upper classes in Russia, as other Europeans find it very difficult to learn to speak the Russian language. Between St. Isaac's and the Neva is the statue of the founder of the city,

# THE PEOPLE OF EUROPEAN RUSSIA



Here is a Russian gypsy girl. There are fewer gypsies in Russia than in England.



These are peasant girls of Little Russia, the part of the Russian Empire in Europe that includes the important towns and towns of Kiev.



These are peasant girls belonging to the province of Tver in the north of Moscow.



The great mass of the people of Russia are very poor. Their domestic and political conditions are very different from those of the people of the West. The poverty of the people can be seen from the picture of the peasants working in the field. The men have to be very hard at work.



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# THE OLD AND NEW CAPITALS OF RUSSIA



In this view of Moscow we see the cathedral of St. Basil, one of the most striking buildings in the city. It has twenty gilded domes and towers of different height and shape, and its towers are of different colors. This curious style of architecture is characteristic of Russia, and is seen in many other parts of the city.



The Cathedral of St. Basil is one of the most famous buildings in Moscow. It was built in the 16th century and is famous for its many colorful domes and towers. It is a great example of Russian architecture. The street in front of it is very busy, with many people and horse-drawn carriages. The large domed building in the background is the Cathedral of the Holy Spirit.



with the English quay on one side and the Admiralty buildings on the other. From the Admiralty the three chief streets, or prospects, radiate in straight lines. The Nevski Prospect, like the Unter den Linden of Berlin, is one of the finest streets in Europe. The Kazan Cathedral is in it, and at its end is one of the most celebrated monasteries in Russia—that of St. Alexander Nevski.

**THE WONDERFUL CHURCHES OF RUSSIA,  
COVERED WITH GOLD AND JEWELS**

It is difficult for us, who are used to plainer houses of worship, to realise the exceeding richness of the decorations in Russian cathedrals and churches. Not only are they adorned with marbles, agates, jasper, green malachite, blue lapis lazuli, and fine work in gold and silver, but there are many sacred pictures, often set with diamonds and other precious stones, and beautiful embroidered hangings, and many other works of art. The services held in these magnificent churches are very grand and solemn.

Next to the Admiralty is the famous Winter Palace, joined to the Hermitage, built by Catherine the Great, and beyond that is the Summer Garden and Palace. In these palaces are stored treasures of pictures, painted by the greatest artists of the world, and also most valuable and interesting collections which illustrate every part of Russian history. The Crown jewels of Russia are kept in the Winter Palace, and form a most gorgeous display, enormous diamonds, and rare rubies and sapphires blazing from crowns and necklaces and sceptres.

The Royal Library, in the Hermitage, contains more than a million books, besides an important collection of manuscripts. Among them are letters from Mary Stuart, Henry VIII, Elizabeth, and Charles I, and there is a writing exercise of Louis XIV in French, "Homage is the right of kings, they do what pleases them." No wonder the boy grew up to declare proudly, "I am the State."

**THE SIMPLE COTTAGE OF RUSSIA'S  
GREATEST RULER**

Just opposite these palaces, across the Neva, is the fortress and cathedral of St. Peter and St. Paul, where all, save one, of the sovereigns of Russia since the foundation of St. Petersburg

have been buried. Peter's boat, "the grandfather of the Russian Navy," in which he sailed about and gained much practical skill, is housed near the cathedral. Close by is the interesting cottage where "the giant wonder worker," as Peter was called, lived on the banks of the river while superintending the building of his city. Two rooms and a kitchen were all he required.

In the Artillery Museum is Peter's carriage with which he measured roads, the number of revolutions made by the wheels being registered by the machinery in the box behind—a sort of taxi-cab. On the lid of the box is a picture of Peter travelling, with forests in front of him, and newly built houses and newly laid-out gardens behind him.

There are many manufactories round St. Petersburg, which also has a large trade, chiefly in produce—timber, tar, hemp, sugar, and beetroot—from the forests and plains close by. Alongside the quays many English and German ships may be seen in the process of loading.

**MOSCOW, THE CITY OF GILDED SPIRES  
AND PAINTED DOMES**

We could spend months in St. Petersburg and not come to the end of all the treasures to be seen in it—treasures from which we can learn much of the story of Russia and its peoples without opening a book, but the whole country lies behind it, and we must hasten on to Moscow, the ancient capital, 400 miles south-east of St. Petersburg. Moscow is now the centre of the railway system of Russia, though the old water routes which connect it with distant parts are still much used.

Over a million people live in both St. Petersburg and Moscow. The older city is the centre of a great cotton trade, and there is a large coal-field in the neighbourhood.

South of the city, where the Moskva river makes a great loop, are the Sparrow Hills. It was from here that Napoleon, surrounded by his staff, surveyed the glittering city at his feet. Thousands of housetops, and trees, and the winding river lie before us, but above all stand out the gilded and coloured domes of the cathedrals and churches and the grim walls of the numerous monasteries. We have already glanced at the history of this bustling and busy city, and now we must visit the Kremlin,

# THE STRANGE PEOPLE OF LONELY SIBERIA

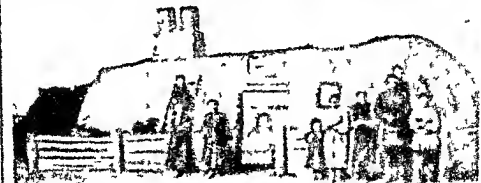


The people of Siberia are a curious mixture of many races. Some of them have lived in the same place for thousands of years, while others have wandered south, and east and north into Siberia, there have been many mixtures of the people of the country.



The Yakuts, shown here in winter, are another race that went into Siberia from the north. They are more hardy and industrious than the Tungusians, through whom they have passed.

Another Siberian race, the Gilyaks, who live in the Amur valley. They are very hardy and are related to the Ainu, the people of Japan.



The Tungusians, who live in the mountains and valleys of Siberia, are a very hardy and industrious race. They are related to the Ainu, the people of Japan, and are the only people of the country who have not been conquered by the Russians.

which is the Tartar name for a fortress. The Kremlin itself consists of a mass of buildings on the higher bank of the Moskva River, shut in by a wall with towers and gates. It is, to Russians, one of the most sacred spots, for here are the Synod buildings, where the Council of the Russian Church meets in solemn state. Here are the ancient garments, some richly embroidered with pearls and precious stones, and the jewelled mitres worn by the patriarchs of the Eastern Church. Here, too, in the Cathedral of the Annunciation, the czars have been baptised and married, and in the Cathedral of the Assumption all the czars from Ivan the Terrible have been crowned, in the Cathedral of the Archangel Michael, the old czars were buried.

Many and greatly revered are the relics and sacred pictures called ikons, and treasures of jewels and gold and silver, to be found in the various buildings of the Kremlin. In the Tower of Ivan the Great are the famous bells which are rung on Easter Eve with such wonderful effect. The enormous "King of Bells," which is 19 feet high and weighs 198 tons, stands at the foot of the tower, with a piece knocked out of its side weighing eleven tons.

#### THE WEB OF STREETS THAT HAS BEEN SPUN AROUND THE SACRED KREMLIN

All round the Kremlin lie streets, arranged like a spider's web, and there are many rich monasteries and great churches and fine houses, and beyond are the factories of all kinds and the hovels of the workers.

It is easy now to pass by train to Kiev on the Dnieper, the mother of Russian towns, and, indeed, one of the most ancient towns in Europe. It has many fine old cathedrals, and also important trade and manufactures. Its companion, Novgorod the Great, near Lake Ilmen, called the cradle of the Russian Empire, bears many marks of its ancient and important history, dating from the times of the Scandinavian Rurik. Here, in 1862, a monument was erected to commemorate the 1,000th birthday of the Russian Empire.

Nijni, or Lower, Novgorod, on the Volga, is also a place of much interest, chiefly on account of the great fair which is held there every summer.

It is said that the value of the goods

brought to the fair for sale amounts to about £24,000,000 sterling, shops and bazaars, and all sorts of buildings cover a large space of ground, and the wares set out in them come from every part of the empire and beyond. There are iron goods from Tula, near Moscow, the Russian Birmingham and Sheffield combined, silks from Persia, precious stones and furs from Siberia and Central Asia, tea from China; rich carpets, dried fruits, cotton goods, silver ornaments, and all sorts of wooden boxes and toys made by the peasants.

#### HOW EAST MEETS WEST IN THE CITY OF THE GREAT FAIR

The wharves of Nijni Novgorod, where most of this merchandise is unloaded by sturdy Tartar labourers, are quite ten miles in length; and the various types of people seen selling, buying, and looking on, show that here Europe and Asia meet and trade.

Steamers ply regularly on the great rivers, such as the Volga, now a peaceful highway of commerce with numbers of towns on its banks, and united with the distant seas by its tributaries and connecting canals. Its course approaches to within forty miles of the Don. Many are the stories of fierce warfare and pirates connected with the great rivers of South Russia. In the past Astrakhan is the port near its delta in the Caspian Sea, the headquarters of the large fishing industry carried on in that inland sea.

Odessa, on the Black Sea, is the great port of the South for sending away the corn grown in the fertile parts of Little Russia. Many of the ships along the quays at Odessa fly the British flag. Wool is exported from the steppes round the Black Sea, and there are many engineering and shipbuilding works in the neighbourhood of this thriving city.

#### A MIGHTY MOUNTAIN, AND A SPLENDID ROAD ABOVE THE CLOUDS

Railways now run down from Moscow and other parts of Russia to the Caspian Sea, skirting the eastern edge of the Caucasus Mountains, which form such a high barrier between North and South. The highest peak, Mount Elbruz, tops Mont Blanc by about 3,000 feet. There is a splendid military road over the Dniel Pass, rising at parts into the clouds, with scenery like that of Switzerland. White peaks against the



blue sky, dashing torrents, glaciers and avalanches, all seem especially beautiful after the bare steppes and rocky deserts that are found not far off. Baku, on the Caspian Sea, famous for its rich mineral oil wells, is connected by the line that runs through Tiflis with the port of Batoum on the Black Sea.

#### RIVERS OF OIL THAT RUN THROUGH PIPES AS LONG AS GREAT BRITAIN

There are special boats and trains to convey this never-failing oil from the wells whence it springs, but, in addition, pipes are now laid, through which pour daily over a million gallons of oil, straight to the tank-boats and reservoirs at Batoum about 600 miles away.

The rail now pushes on beyond the Caspian Sea, and links together the fertile oases which lie like green islands in a sea of sand, watered by rivers which afterwards lose themselves in the surrounding dry and rocky soil. In these oases, rice, wheat, and fruits are grown. Here, in Russian Turkestan, most of the people are Mohammedans, and numbers lead a wandering life, keeping camels, cattle, sheep and horses wherever sufficient pasture can be found on the dry and barren steppelands.

But the greatest achievement in linking together the far distant parts of the great empire by means of the iron rails is the Siberian Railway, from Moscow right across Asia to the Sea of Japan, an arm of the Pacific Ocean.

This railway reminds us, in some ways, of those that run across America. It is longer, and much of the scenery is dreary and flat, and often it runs through endless forests. It crosses over the Ural Mountains near Ufa, a district famed for iron mines and foundries, as well as for its riches in gold and precious stones.

#### THE LONGEST AND MOST MARVELLOUS RAILWAY IN THE WORLD

There are no tunnels, and there is none of the exciting, hair-breadth travel that the great lines of the New World furnish among the Rocky Mountains. In winter it is so cold on the Siberian line that meat, butter and fish need no refrigerating cars. The water for the engines has to be brought hot, or it would freeze on the way.

A great feature of this line is the number of bridges needed. One that crosses the Volga near Samara is nearly a mile long, and many more are passed

on the way through West and East Siberia, crossing over the immense rivers that drain so slowly and quietly across Siberia from the South to the frozen Arctic Sea. The Obi, the Lena, and the Yenisei are all, like the Volga, over 2,000 miles long; so is the Amur, which flows east to the Sea of Japan; and many of the tributaries which join the Arctic rivers are long and important, and have helped much in the development of the country. In West Siberia the railway runs through a belt of very fertile black earth, like that in Little Russia, where wheat is grown, and immense dairy farms are rapidly developing.

Thousands of settlers from other parts of Russia are brought every year by train to fill up the vast silent tracts of Siberia. The line runs past Omsk and near Tomsk, past Irkutsk, round the south of Lake Baikal—a most difficult piece of engineering, then onwards through Manchuria, which belongs to China, to Vladivostok, with a branch line to the city of Peking.

#### THE MONSTERS OF A PAST AGE WHOSE BODIES ARE PRESERVED TO-DAY

Many towns are growing up on the line, both trade centres and mining towns. Omsk is the centre of the agricultural industry of Siberia. At Irkutsk, the largest town in Siberia, are gold-smelting works, besides other industries, and a university.

The coldest place in the world is on the River Lena, where the difference in the winter and summer temperatures is the greatest known. There are islands in the Pacific where the temperature is almost the same all the year round.

At the mouth of the Lena, and in other parts of the Arctic shores, the remains have been discovered of mammoths with long, woolly hair, frozen hard in the icy mud by which they were suddenly overwhelmed ages ago. Their flesh, when first exposed, was actually eaten by the wild animals prowling around. Some of the monsters have been preserved and set up in various museums, and interesting photographs have been taken of these creatures, so miraculously kept for centuries after all their kind had disappeared from the earth.

There is a large trade in ivory from the tusks of these prehistoric animals found in the New Siberian Islands, which lie off the mouth of the Lena.



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The rail now pushes on beyond the Caspian Sea, and links together the fertile oases which lie like green islands in a sea of sand, watered by rivers which afterwards lose themselves in the surrounding dry and rocky soil. In these oases, rice, wheat, and fruits are grown. Here, in Russian Turkestan, most of the people are Mohammedans, and numbers lead a wandering life, keeping camels, cattle, sheep and horses wherever sufficient pasture can be found on the dry and barren steppelands.

But the greatest achievement in linking together the far distant parts of the great empire by means of the iron rails is the Siberian Railway, from Moscow right across Asia to the Sea of Japan, an arm of the Pacific Ocean.

This railway reminds us, in some ways, of those that run across America. It is longer, and much of the scenery is dreary and flat, and often it runs through endless forests. It crosses over the Ural Mountains near Ufa, a district famed for iron mines and foundries, as well as for its riches in gold and precious stones.

#### THE LONGEST AND MOST MARVELLOUS RAILWAY IN THE WORLD

There are no tunnels, and there is none of the exciting, hair-breadth travel that the great lines of the New World furnish among the Rocky Mountains. In winter it is so cold on the Siberian line that meat, butter and fish need no refrigerating cars. The water for the engines has to be brought hot, or it would freeze on the way.

A great feature of this line is the number of bridges needed. One that crosses the Volga near Samara is nearly a mile long, and many more are passed

on the way through West and East Siberia, crossing over the immense rivers that drain so slowly and quietly across Siberia from the South to the frozen Arctic Sea. The Obi, the Lena, and the Yenisei are all, like the Volga, over 2,000 miles long, so is the Amur, which flows east to the Sea of Japan, and many of the tributaries which join the Arctic rivers are long and important, and have helped much in the development of the country. In West Siberia the railway runs through a belt of very fertile black earth, like that in Little Russia, where wheat is grown, and immense dairy farms are rapidly developing.

Thousands of settlers from other parts of Russia are brought every year by train to fill up the vast silent tracts of Siberia. The line runs past Omsk and near Tomsk, past Irkutsk, round the south of Lake Baikal—a most difficult piece of engineering, then onwards through Manchuria, which belongs to China, to Vladivostok, with a branch line to the city of Peking.

#### THE MONSTERS OF A PAST AGE WHOSE BODIES ARE PRESERVED TO-DAY

Many towns are growing up on the line, both trade centres and mining towns. Omsk is the centre of the agricultural industry of Siberia. At Irkutsk, the largest town in Siberia, are gold-smelting works, besides other industries, and a university.

The coldest place in the world is on the River Lena, where the difference in the winter and summer temperatures is the greatest known. There are islands in the Pacific where the temperature is almost the same all the year round.

At the mouth of the Lena, and in other parts of the Arctic shores, the remains have been discovered of mammoths with long, woolly hair, frozen hard in the icy mud by which they were suddenly overwhelmed ages ago. Their flesh, when first exposed, was actually eaten by the wild animals prowling around. Some of the monsters have been preserved and set up in various museums, and interesting photographs have been taken of these creatures, so miraculously kept for centuries after all their kind had disappeared from the earth.

There is a large trade in ivory from the tusks of these prehistoric animals found in the New Siberian Islands, which lie off the mouth of the Lena.



## WHERE DO SHELLS COME FROM?

The shells in the sea are the little houses that living creatures have made for themselves from their own outside. The sea is crammed with life from the surface to the bottom and from its edge on the shore to its centre. A very large number of the living creatures in the sea make shells for themselves partly to protect them from the fish that would like to eat them and partly to protect them from the force of the water.

We call these creatures shell fish but the name is a very bad one. No fish makes a shell and these creatures are not fish at all but are lower in the scale of life. A fish is an animal that has a backbone and a skeleton that lies inside its body. The shell of the creature that produces the shells of the sea is soft and does not have a backbone nor any other skeleton.

These creatures are of all sizes from the smallest to the largest. They are found in all parts of the sea. They are not all the same but they are all very different. They are not all the same but they are all very different. They are not all the same but they are all very different.



Some of the shells are very small and some are very large. Some are very hard and some are very soft. Some are very smooth and some are very rough. Some are very white and some are very dark. Some are very round and some are very flat. Some are very simple and some are very complicated.

Some of the shells are very old and some are very new. Some are very common and some are very rare. Some are very beautiful and some are very ugly. Some are very useful and some are very useless.

Now can we tell what is at the bottom of the sea?

We don't yet know all about the bottom of the sea. There are several ways in which we can learn something about it. We can go to the bottom of the sea and look at it. We can send a boat to the bottom of the sea and look at it. We can send a submarine to the bottom of the sea and look at it. We can send a diver to the bottom of the sea and look at it.

There are many things at the bottom of the sea. There are many shells. There are many fish. There are many plants. There are many animals. There are many things that we don't know about. There are many things that we are just beginning to learn about.

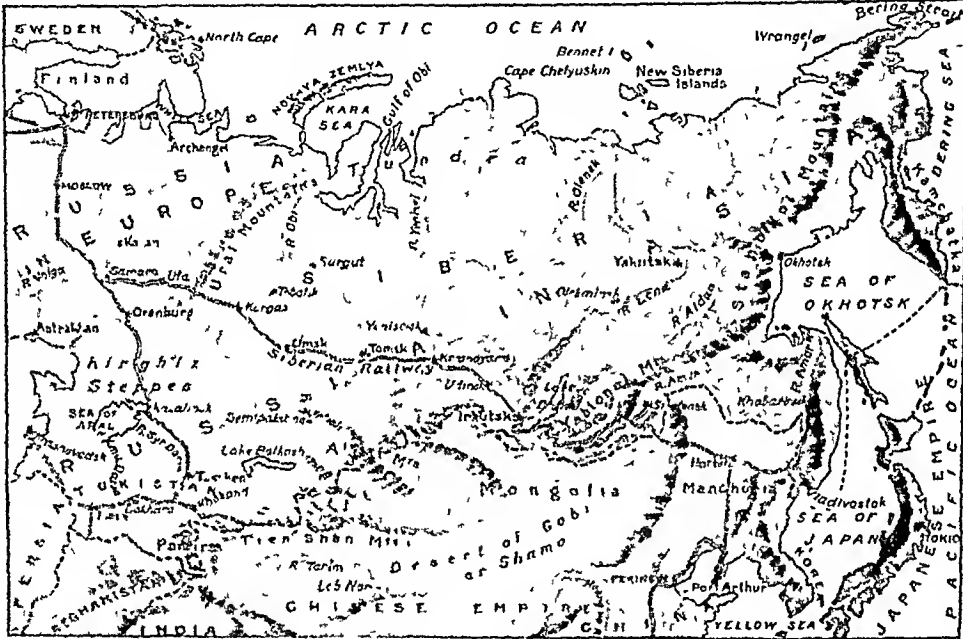


burst out into open revolt. From time to time Europe is startled and horrified by the news of assassinations of the leaders of the government, by men banded together to destroy the existing state of things in the swiftest way they can devise.

It is one of the chief objects of the government of the Czar to detect and defeat all the efforts made for freedom. So spies and police are sent in every direction to people's homes, to the universities, even to debating and Shakespearean societies, and on bare suspicion men and women and mere children are seized, put in prison without

methods, is Tolstoy. He lives in the heart of Russia, not far from Tula, the busy district near Moscow. This old man of eighty, with the long white beard and piercing eyes, wears a peasant's smock, and leads a working peasant's life. Perhaps he is the only man in Russia who is not afraid of the Czar.

And yet many have been imprisoned for only possessing the books which he writes and publishes for the whole world to read. Some of these books give beautiful, if sad, pictures of the peasants he loves so well—the peasants whose lives he shares, though he was



THIS MAP SHOWS THE RUSSIAN EMPIRE IN ASIA, WITH ITS VAST PLAINS AND MIGHTY RIVERS

trial, and sent away to dreary exile or bitter death. In some cases their sorrowing friends never know their fate.

Is it any wonder that this unjust violence—and we cannot tell the half of it—has called out mad, unreasoning violence to meet it, and caused many desperate deeds? But, mercifully, all reformers in Russia do not believe in using bombs to gain their righteous demands. Many go on in patience, teaching and preparing the ground for the final struggle and the success that must come sooner or later.

The greatest leader of thought in Russia, as well as the greatest influence for gaining freedom by peaceful

born a rich man—and of the attempts he has made to educate them. Others, again, show in burning words the terrible wrongs suffered by Russian reformers at the hands of spies, police, and governors. His voice, too, rings clear and loud as he denounces the wrongs of the peasants, the evils of luxury, the hollowness of the state religion, the wickedness and waste of drawing men from their homes to train them to kill their fellow-men.

And no one dares to touch Tolstoy as he utters his brave and inspiring words, standing out boldly against the dark background of Russian misery.

The next story of Countries is on page 3873.

ourselves we feel air waves and we also feel them when someone suddenly shuts a door or when we stand on a station platform and an express train whizzes by. But when the air waves are very much smaller and quicker we cannot feel them with our hand but we feel them with our ears and then we call them sounds. Some of the very largest and slowest air waves that can just be heard by our ears as a very deep faint low sort of boom can also be just felt by our hands. This of course depends upon the limits of hearing in the person in question for some people can hear much lower notes—that is to say much slower waves—than others.

WHY CAN IRON FLOAT ON MERCURY IF  
IT CANNOT FLOAT ON WATER?

All questions of floating and swimming and flying depend on the comparative differences between various things as regards gravitation. Iron is heavier than water or as we say its specific gravity is greater than that of water. Iron must therefore sink in water. Mercury is heavier than water and therefore mercury must sink in water. But mercury is heavier than iron and it must therefore sink in iron which is just a peculiar way of saying that the iron must float in the mercury. The thing with the highest specific gravity is the thing for which the earth has the strongest pull. It therefore gets nearest to the earth and anything else must float on the top of it.

WHY CAN IRON BE BENT WITH A HEATID?

We all know that things can very much in the way they behave when something tries to alter their shape. Some things will rather break than bend others will bend and then come back again to their old shape. Yet others will bend and stay in the new shape even when the bending force is removed. Various special cases are applicable to these different types of material. A general rule that applies to all ways is that the order of the material is not altered. Even the three great water states of solid, liquid and gas are not altered in the order of their molecules. The only state that they can have a substance at 273° and as a result of this is that the molecules are in a state of disorder. The only way to get a substance to be in a state of disorder is to heat it to the point where it melts or boils or sublimates. The only way to get a substance to be in a state of order is to cool it to the point where it freezes or condenses or deposits. The only way to get a substance to be in a state of order is to cool it to the point where it freezes or condenses or deposits.

quarters, many of the wonderful creatures that live at the bottom of the blue sea, such as sea-anemones

But divers cannot go down many scores of feet, and the sea is often miles deep. If we want to learn about the deeper parts of the sea, we must dredge them—that is, let down something that will scrape along the bottom, and catch hold of anything that will come away, and then the catch can be hauled up to the surface, and we can study it. This is costly, and takes time, but much of it has been done, and we have already learnt a great deal about the bottom of the sea by this means.

**WHAT MAKES WATER GURGLE WHEN IT COMES OUT OF A BOTTLE?**

We know that the air has a pressure, and so, if there is an empty space anywhere, the air will press into it. Now, when we pour water out of a bottle which is full, there must be an empty space left behind in the bottle when the liquid comes out, and from moment to moment, as that empty space tends to be formed in the bottle, the air outside is bound to rush in to take its place. If the bottle has a wide mouth, like a tumbler, then, as we pour the liquid out, air can flow in evenly, and there is no gurgling.

But if we take a full ginger-beer bottle, and hold it upside down, then there is a series of fights going on between the liquid, which is trying to get out under the pull of gravitation, and the air, which is trying to push its way past the liquid to fill up the space in the bottle. Sometimes the air pushes back the ginger-beer, and sometimes the ginger-beer pushes back the air. This means that the air is thrown into little disturbances, which we hear as gurgles. We say that water gurgles, but really, of course, it is the air that is disturbed by this contest between it and the water, and we call these disturbances "gurgles."

**WHY DO EMPTY VESSELS MAKE MORE SOUND THAN FULL ONES?**

In the study of sound we soon discover the existence of things which help to magnify a sound. The virtue of these things is that they resound, and so they are called *resonators*. The body of a violin is a resonator, and so are our chests and the spaces of the mouth and nose when we sing. If we

play a violin from which the body has been taken away, the sound is weak, and thin, and ugly, and the difference between a violin worth £2,000 and one that is not worth £5 is to be found in the body, or resonator. The whole point about a resonator is that the air inside it can be thrown by it into sound-waves. If there is no air inside it, of course its use is gone. An empty vessel is a resonator. If it is filled with fluid, it can no longer act, it makes far less sound, and the weight of the fluid quickly stops what sound it does make, acting like the dampers in a piano. If we were to fill the body of a violin with water, we should get the same result as if we held the body of the violin tightly in our hand when playing it.

**WHY, IF WE TOUCH A GONG, DOES THE SOUND CEASE?**

The sound of the gong, like all other sounds, is due to waves of air that strike against the little drum inside our ears and are translated by the nerves of hearing into what we call sounds. These waves in the air are made by something. In the case of a gong or the string of a piano, they are made by a vibration which has been produced by striking the gong or the string. When we play a note on the piano, a hammer strikes a string, if we let go the note, the sound stops. It stops for exactly the same reason as the sound of the gong stops.

When we touch a gong, we stop its vibrations, and therefore we stop the movements of the air which those vibrations were causing. If we are doubtful as to what a vibration really is, we only have to touch the gong gently after striking it, and we shall understand. In the case of the piano, when we let go the note we have just played, the sound ceases at once, because the damper, as it is called, which was raised from the string when we played the note, is allowed to fall on it again, and damps the vibrations. We do exactly the same when we have accidentally struck a tumbler and set it ringing, if we handle it, it stops.

**WHY CANNOT WE FEEL AIR-WAVES WITH OUR HANDS?**

This is simply a question of the delicacy of the sense of touch. Our hands can and do feel air-waves of certain rates and sizes. When we fan



If our eyes could see them they would certainly be of different colours to the light that we can see. The notes below the red end of the octave that we can see would appear as some other colour which, of course, we cannot imagine, and the notes above the violet end of the octave we can see would appear as another colour. It has been clearly proved that some insects, such as ants, can see these rays of light beyond the violet, to which our eyes are blind. But what colour it looks like to them, of course, no human being can ever tell. It is very interesting to know, however, that there are animals which can see notes of light which we cannot see, just as there are animals which can hear notes of sound too shrill for our ears to hear.

**WHY DOES A DIVER NEED LEAD ON HIS BOOTS TO MAKE HIM SINK?**

The diver would certainly sink without the lead on his boots. His body itself is heavier than water, and though the small quantity of air between himself and his case tends to make him float, yet the metal round his head makes him heavier still. The point about the lead on his boots is that it makes him sink in the right direction. If it were not for that he might sink head first or sideways, and might find it exceedingly difficult or impossible to right himself. The lead serves, in a way, the same purpose as a piece of lead placed at the bottom of those little toys which cannot be upset, however much they are pushed about. A closer parallel still is the case of the balloon, which is kept the right way up by having its heaviest part below.

**WHY IS SALT DAMP WHEN IT IS GOING TO RAIN?**

When we say that the salt is damp, we mean that it has taken a lot of water into itself, and of course it has absorbed the water from the air. Common salt, like a host of other things, will help itself to the water in the air, though many other salts will do so far more readily than common salt does. We are speaking, of course, of water that was in the form of gas, making up one of the gases in the air. Plainly, the reason why salt becomes damp before it rains is that before it rains there is an unusual amount of water-vapour in the air. Indeed, the rain is due to the fact that the water-vapour in the air has become

too great in amount for the air to hold it any longer, and so down it tumbles in the form of rain. When raindrops form, we know that the water-vapour of the air condenses in little drops around particles of dust, and so on, in the air. Well, that is exactly what happens when the salt becomes damp. The water-vapour in the air has condensed upon the particles of salt.

**WHY DOES THE SUN MAKE OUR HANDS AND FACES BROWN?**

For a long time the answer to this question was very uncertain. Doctors used to have the idea that every change produced in the body out of the ordinary was a disease—was something wrong. But a great many of these things that are too often looked upon as diseases, or as something wrong, are really instances of the marvellous power of the body to adapt itself to special circumstances. In this case, for instance, it used to be thought that some injury was done by the browning of the skin.

What really happens is that the skin turns brown in order to protect the blood underneath it from the too strong rays of the sun. The brown paint, or pigment, as it is called, that is formed in the skin catches up the sun's rays and absorbs them, and so the precious blood that runs in thin-walled blood-vessels just under the skin is protected.

Sunlight is exceedingly good and necessary for us, but there is only a certain intensity of it that is good, and beyond that it becomes harmful. People vary very much in the extent to which they brown under the sun. It is said that the people who can live best in the tropics are those in whom the skin has the best power of making the brown pigment to protect the body. It may be that the deep colour of dark races is protective, and that is why we find darker peoples nearer the tropics and fairer peoples nearer the Poles.

**WHY DOES THE SURFACE OF WATER NEVER CURVE OR SLANT?**

Water, like everything else, is under the influence of gravitation. All the parts of it must therefore get as near as possible to the centre of the earth. In the case of a solid thing, those forces which hold it together partly oppose the force of gravitation, and so an india-rubber ball, for instance, will remain as a ball, though if it were melted it would

crust is disturbed yet a war of attrition passes from that place north through the crust of the earth.

WHY CANNOT WE BREATHE UNDER WATER?  
As we know, there is no dissolved in  
water and it is this fact that enables  
oxygen to exist under the water.  
Now, it has a special part of a body  
made for the purpose of getting the air  
out of the water. The water is taken  
in by the gills and all went to it  
all the way down to the gills. The  
gills are called the gills.

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boiling for some time we do it is very completely. As it cools the water gradually settles a little in one part and again but you shall find it very flat and dull to drink. The thing to do is to pour it through a cloth through the air from one vessel to another a few times, and then it will become sparkling, and pleasant when we go on boiling the water a few more times, and then we are for making tea or coffee we spread the beverage because we drive out the air dissolved in the water. The water is then in all of course be that in a glass or in a tumbler, and that is the kind of which was provided for the use of the people for drinking, for with it we did not dissolve in water one life of any kind could exist in water.

But if the fall was by his own  
 choice of it  
 why the part of a fall was not  
 because the earth is a ball and we cannot  
 through space and this must happen  
 the whole earth is taken as it rolls  
 and it rolls slowly  
 in an unceasing  
 We should really speak of earth-shaking  
 movements exactly the point they make  
 call earthquakes and this question  
 is a word for what happens in what we  
 is a born thing, us that we really feel  
 People who study these things have  
 PARTING AN ANKLE ONLY PART OF IT  
 IF THE EARTH IS A BALL, WHY DOES AN

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great new observatories, containing the finest telescopes in the world, have been specially built on the tops of mountains, or, at any rate, as high up as possible in parts of the world specially chosen for the clearness of the air—and the higher the telescope, of course, the less the amount of even clear air that the light from the stars has to pass through before it reaches the eye of the astronomer or the lens of the camera.

#### HOW CAN WE TELL HOW MANY DAYS THERE ARE IN A YEAR OF A PLANET?

If we know how long a planet takes to go once round the sun, then we know the length of its year. Then if we can watch the planet, and see how long it takes to spin round once on itself, we know the length of its day. Divide the length of the year by the length of the day, and we have the number of days in the year. But though that is quite easy in some cases, in others, unfortunately, it is impossible, and so we cannot yet tell the number of days in a year of any planet. The trouble is that, though we know how long the planet takes to go round the sun, in some cases—as, for instance, in the case of Neptune—the planet is so far away that we cannot make out any of the features of its face, and therefore cannot tell at what rate it spins, or even that it spins at all, and we do not know the length of its day, though we do know the length of its year.

#### DO THINGS WEIGH HEAVIER OR LIGHTER WHEN HOT OR COLD?

This question about gravitation is really extremely interesting, because it so happens that this is one of the very questions on which a great many remarkable experiments have quite lately been made. There is no doubt about the answer to it, but we must understand what that answer really is. It is that the power of gravitation is not in the slightest degree affected by temperature, in other words, one and the same thing—if nothing is taken from it or added to it—weighs just the same, however much it is heated, or however much it is cooled. But we must not be confused. When a thing is heated it swells, as a rule, and as there is no more of it there, but it is occupying more space, it is made lighter in proportion to the space it occupies. Thus hot water will float on the top of cold

water, hot air will rise in cold air, and so on. This, however, is not a question of absolute weight, but of the relation between that weight, which is not changed, and the volume of the thing.

#### DO EAR-RINGS AFFECT OUR EYES?

I do not know anything good that can be said of ear-rings, said the Wise Man; but, of course, we must not say any evil of them that is not true. It is utterly untrue that piercing the ears, with or without the wearing of ear-rings, has any effect at all upon the eyes. There is no reason whatever why it should have such an effect, and hundreds of thousands of cases every day prove, of course, that it has not. Perhaps, if we want to say the best we can for ear-rings, we must add that, at any rate, they do less harm than nose-rings, which are worn for the same reason—that is to say, for ornament—by many savages.

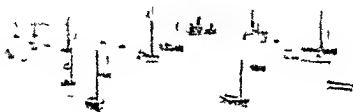
#### IF LIGHT IS A WAVE OF AIR, DOES THE LIGHT-WAVE GO THROUGH GLASS?

Light is *not* a wave of air; it is a wave in the ether, and this ether is everywhere—in the air and in the glass, too. When the light passes through glass, it is a wave in ether all the time, though during part of its journey the kind of matter called air is there, too, and in another part the kind of matter called glass is also there. This is not to say, of course, that matter has no effect on these ether-waves, for we know that it has. All we can say is that some kinds of matter offer no great obstacle to their passage, as, for instance, glass, while other kinds of matter, as, for instance, wood or stone, interfere very much with their passage. Sound is a wave of air, and where sound passes through glass, the air-wave on the outside throws the glass into a wave of the same kind, and the wave in the glass starts a new wave in the air on the other side, and so the sound goes on.

#### DOES AIR DISSOLVE IN WATER?

Certainly air dissolves in water, and the pleasant taste and sparkle of nice drinking-water are due to the air dissolved in it. If we are in some part of the country where we are not sure about the water, and fear there may be dangerous microbes in it, perhaps we boil it in order to kill them. When we boil it, we drive out the air which was dissolved in it, and if we keep up the


## The Childs Book of FAMILIAR THINGS



## HOW WE GET OUR FISH

A GREAT army of about 100,000 fishermen are engaged in the fisheries of Great Britain and besides these there are thousand and thousand engaged on shore making barrel and boxes for the fish and salting, curing and packing the fish. There are all sorts and sizes of boats at work from the big steam trawlers to the little sailer's boat—6,000 of them all told. Scotland has the greatest number—nearly 33,000 boats—with their machinery and tackle about £4,000,000. Ireland and Wales being home most in their boats the total sum raised by their fishing trade is as much as £8,000,000 in a single year. Scotland claims only about £3,000,000 for the same period while Ireland's return is about £400,000.

Most of the fishes are caught by nets. The most important method is trawling. A great trawler has been dragged over the floor of the sea. The bottom of the net is on the fish at the bottom and it is then pulled up when they are caught by the net. The fish are then taken to the shore and sold. The fish are then taken to the shore and sold. The fish are then taken to the shore and sold.


 Summers go out and  
 take the catch: many  
 of the salmon, first  
 but many of the big  
 trout is caught there  
 in ice until they return to port  
 The trawl net is cast all  
 over the sea and all  
 the fish are taken  
 We see the boat with its lines and  
 hauls and every nearly 5  
 boats are used

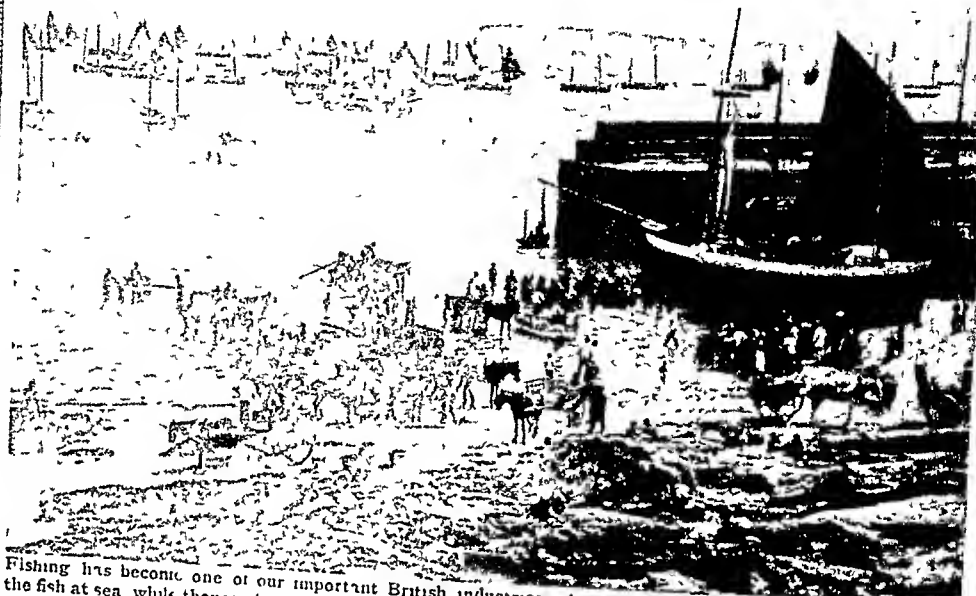
Next we have drift net fishing. At the sea shore we can see more a long line of U.S. boats fishing on the top of the sea. If we will look down into the water we should see that the nets hang straight down from top, & attached to them are a line a wall of netting. The herriots get the fish head on, & it is the narrow end of the net. They cannot go further than that because they tails are too big and they cannot get to it because they get in entangled.

but this is the first time she has been  
shown. About a month ago, she was  
out of the hospital and she was  
a lot better. She is still in the hospital  
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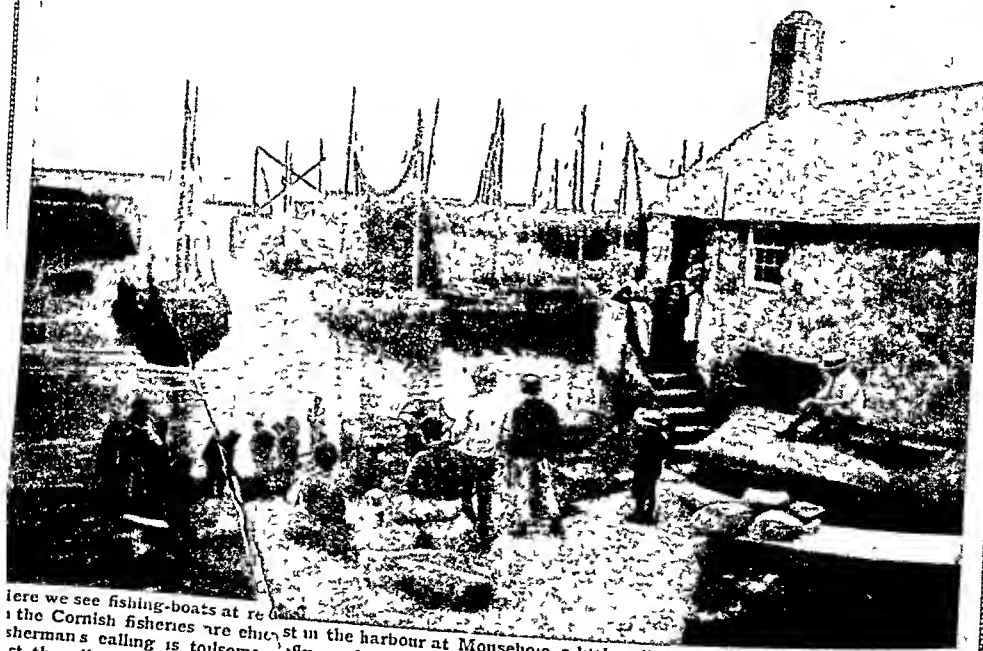
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# THE BOATS THAT CATCH THE FISH

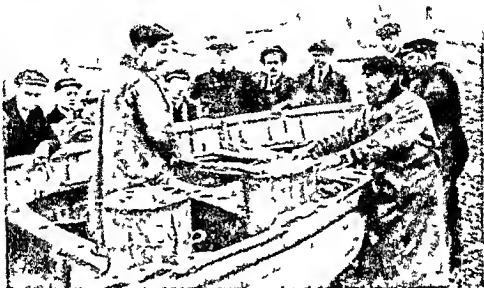


Fishing has become one of our important British industries, about 100,000 men being engaged in catching the fish at sea while thousands more are occupied in preparing and selling them on land. The value of the fish landed in the United Kingdom in one year is nearly £10,000,000, while the weight of a year's catch is equal to 10,000,000 sheep and 1,000,000 cattle. In this picture we see fish being landed at Newlyn, in Cornwall.

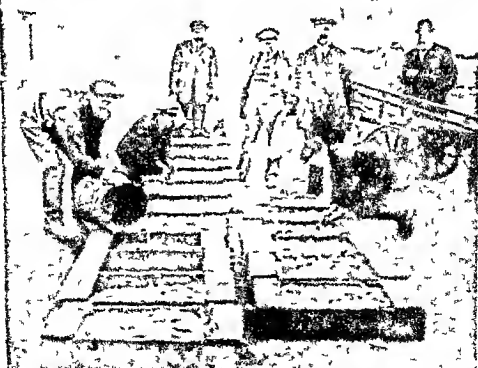


Here we see fishing-boats at rest in the harbour at Mousehole, a little village near Newlyn. The fish caught in the Cornish fisheries are chiefly mackerel and pilchards, and their value in a year is about £70,000. The fishermen's calling is toilsome and dangerous, and in ten years 2,500 men engaged in the British fisheries lost their lives, in one way or another. Four-fifths of the fish landed in England comes from the North Sea.

# PACKING THE SPRATS FOR THE MARKET

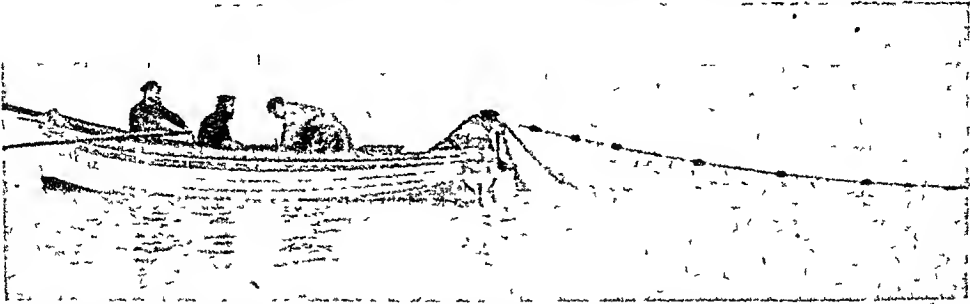


It is a busy scene at the sprat market. The men are packing the sprats into crates for the market. The men are working hard to get the sprats ready for the market.



These men are busy packing the sprats into crates for the market. The men are working hard to get the sprats ready for the market. The men are working hard to get the sprats ready for the market.

## CATCHING SPRATS OFF THE EAST COAST



In this picture we see a drift-net for sprats being let out from a boat. The net has pieces of cork placed at intervals along the top in order to keep it floating, and one end of the net is fastened by a rope to the boat. The boat then drifts, and the fish swimming against the net get their heads caught in the meshes and cannot escape.



The net is then hauled in and the boatmen row ashore. Drift-nets are used only for fish that swim near the surface of the sea, like mackerel, pilchard, and sprats, and usually a number of the nets are fastened together.

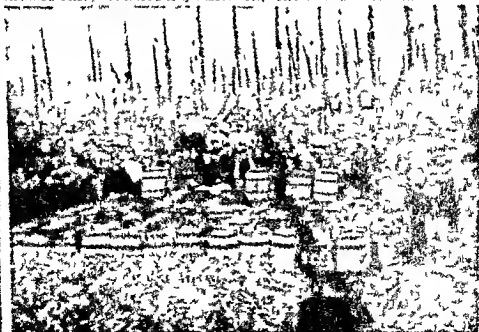


The boat on reaching shore is pulled up on the beach, and the sprats are then shaken out of the nets, ready to be sorted and packed for the market. The pictures on this page show sprat-fishers at Aldeburgh, in Suffolk.

## MILLIONS OF HERRINGS FOR THE SHOPS



After being landed on the quay as shown in the picture on page 1, the herring is sorted, packed in barrels and put in large tubs ready to be sent off to London and other ports. The picture shows the herring of the North Sea fishery from Holland and Germany which have a reputation for quality.

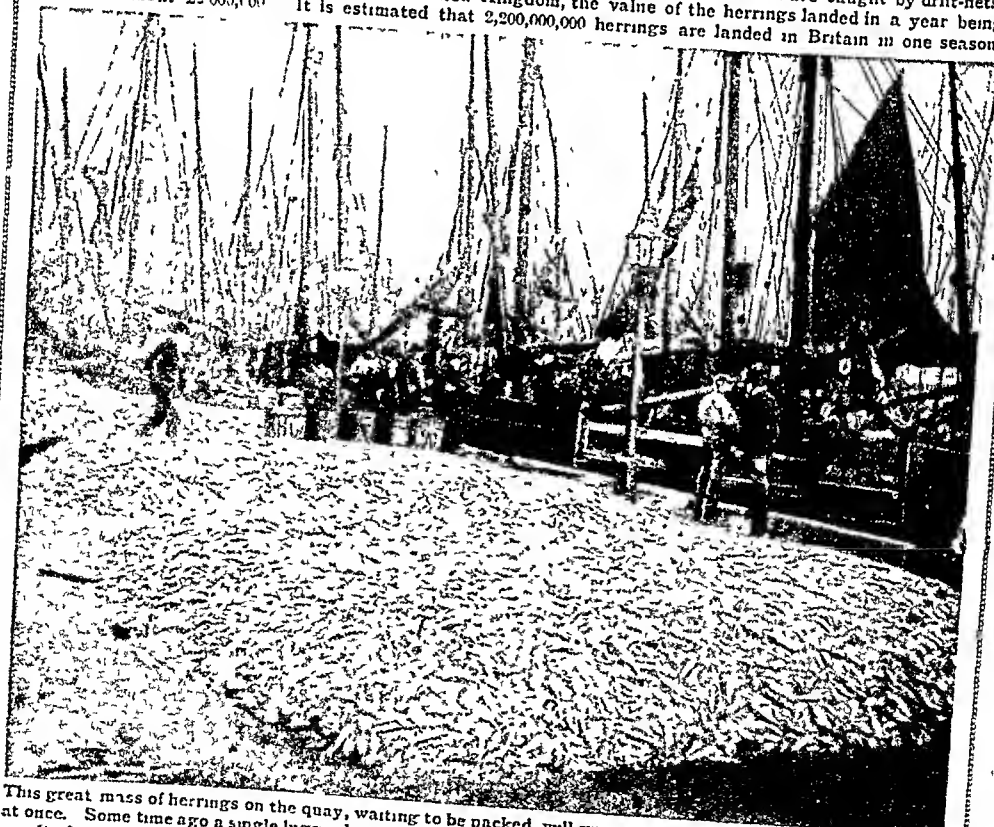


Here the herring is sorted. The large tubs are used for sorting the fish into different grades. The fish are then packed in barrels and sent to the shops. The picture shows the herring of the North Sea fishery from Holland and Germany which have a reputation for quality.

# A GREAT HARVEST OF HERRINGS

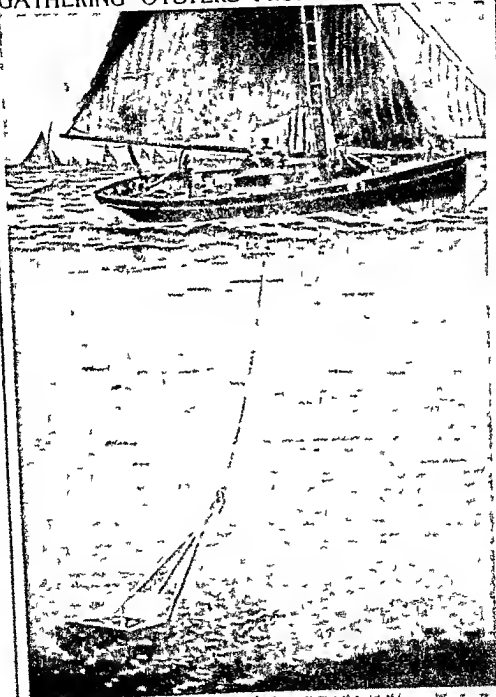


Here we see a catch of herrings being landed on the East Anglian coast. These fish are caught by drift-nets, and they form the principal fishery of the United Kingdom, the value of the herrings landed in a year being equal to about £2,000,000. It is estimated that 2,200,000,000 herrings are landed in Britain in one season.



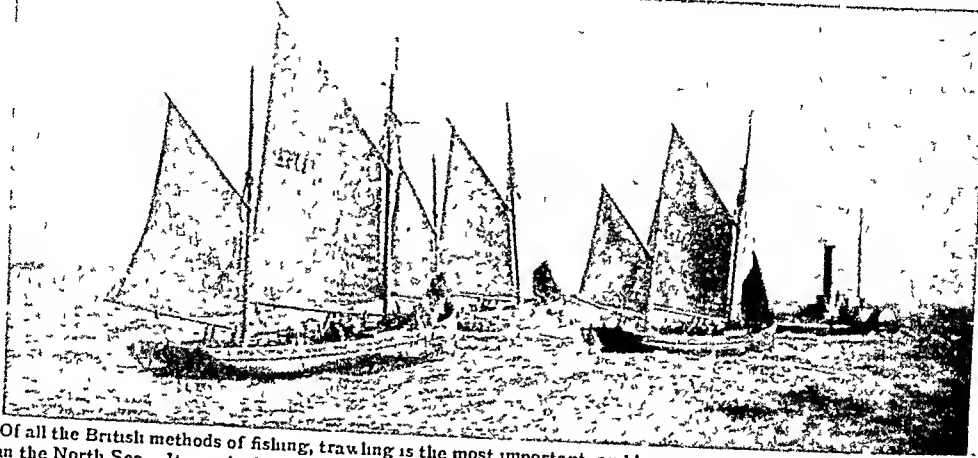
This great mass of herrings on the quay, waiting to be packed, will give some idea of how many fish are landed at once. Some time ago a single lugger brought to land a quarter of a million herrings, which realised £160, the result of a single night's fishing. Herrings are caught principally in the North Sea, where they always abound.

# GATHERING OYSTERS FROM THE SEA-BED

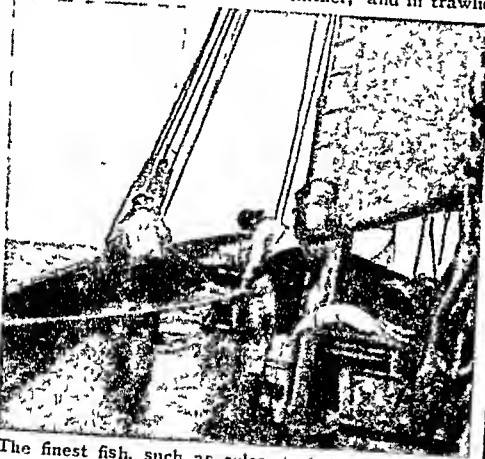


A large ship is shown towing a long dredge behind it. The dredge is a long, narrow boat with a large net or dredge at the end, which is used to scoop up oysters from the sea-bed. The ship is a large sailing vessel with multiple masts and sails. The dredge is being towed by a rope or cable. The scene is set on the water, with the sea-bed visible below the dredge. The illustration shows the process of gathering oysters from the sea-bed.

# TRAWLING-SMACKS AND STEAM-TRAWLERS



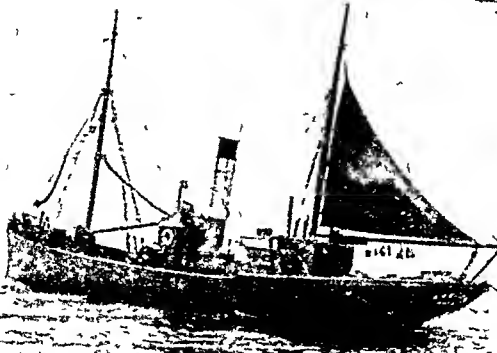
Of all the British methods of fishing, trawling is the most important, and here we see a fleet of trawling-smacks in the North Sea. It is only during the last sixty years that trawling has come into general use. The word trawl means "to go hither and thither," and in trawling a net is dragged by the boats along the sea-bottom.



The finest fish, such as soles, turbot, and brill, are caught by trawling. As the net is dragged along the seabed the fish are caught in the mouth of the trawl, which is then hauled on deck, as is being done by these men.



The trawlers remain at sea sometimes for weeks, and their catches are collected by steamers that take the fish to London. Ferrying the fish from trawler to steamer is often dangerous work, as can be seen here.



Sailing smacks are fast giving place to fine steam-trawlers like that shown in this picture. These vessels cost about £7,000 but can do the work of nine or ten sailing boats. One steamer, after towing her trawl-net for only four hours caught over seven tons of fish. Steam-trawlers began to be used only about thirty years ago.

## AT WORK ON A GREAT OYSTER FARM



At many parts of the coast of France oysters are reared artificially and here we see a view for a corner of the great oyster nursery at Canele which lies on the south of Brittany opposite our island of Jersey.



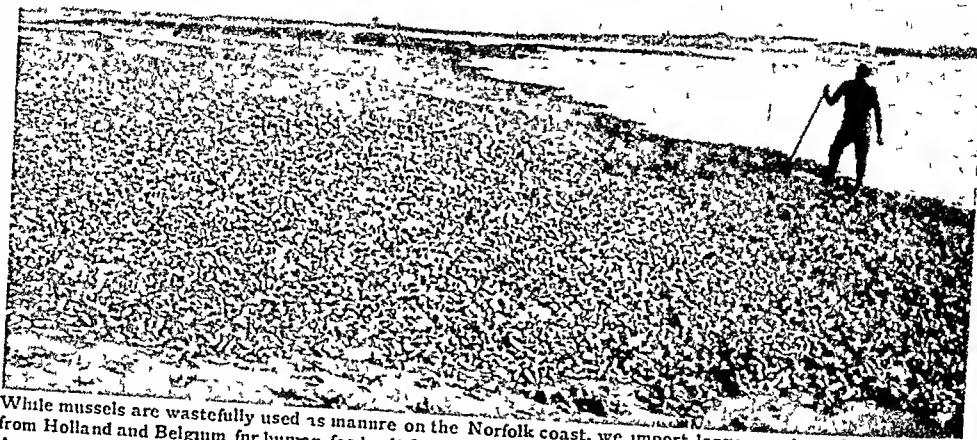
Another famous French oyster nursery is that of Artachon, on the Bay of Moray near Brest. It is visited every year by thousands of English people to whom the picturesque oyster-women working in rows, like these, are a familiar sight. They have been gathering oysters from the bay for the market since the time of the Romans.



In the foreground we see the wooden racks, and in the background the oyster-women working in rows, like these, are a familiar sight. They have been gathering oysters from the bay for the market since the time of the Romans.



# GATHERING MUSSELS AT LOW TIDE



While mussels are wastefully used as manure on the Norfolk coast, we import large supplies of this shell fish from Holland and Belgium for human food. It is a rather popular food in England, though it is not eaten in America, and is very little used for food in Scotland. Here we see a large mussel-bed on the Belgian coast as it appears exposed at low water. In this country and in most European lands mussels are largely used as bait.



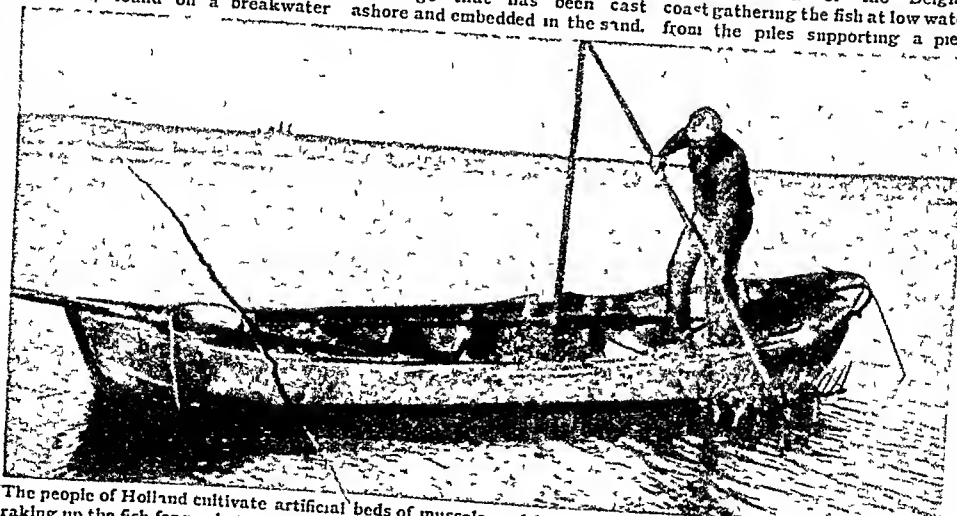
A Belgian woman gathering mussels from a natural bed of this shell-fish, found on a breakwater.



Mussels growing on a piece of wreckage that has been cast ashore and embedded in the sand.



A mussel-fisher of the Belgian coast gathering the fish at low water from the piles supporting a pier.



The people of Holland cultivate artificial beds of mussels, and here we see a Dutch mussel-farmer in his boat raking up the fish for market. The Dutch are very successful at this artificial mussel-rearing, but it is interesting to know that they get a very large proportion of their spawn, or eggs, from the coasts of Kent and Essex.

### WHAT THIS STORY TELLS US

## THE PARTS OF THE BRAIN

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... thing he  
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brain called the *tail*. The sequence of it is that the left side of the brain is the master of the right side of the body. Exactly the same is true in respect of the right side of the brain and the left side of the body.

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# COLLECTING AND WASHING THE OYSTERS



Hundreds of women are employed in the oyster industry at Cancale, and here we see an oyster-gatherer at work

After they have been gathered, and before being packed for market, the oysters are washed in special baskets



On page 3773 we see the rearing-cases where the spat, or spawn, is hatched. When the oysters are six months old they are removed, as is being done by the men in this picture, and placed in the oyster beds



Here the oysters are receiving a final washing before being packed. They are plunged up and down in the water and vigorously shaken in the cleansing-baskets

At last, when the cleansing is complete, the oysters are put in square baskets, like the one seen in this picture, and wheeled on trucks to the packing sheds

THE NEXT FAMILIAL THINGS ARE ON PAGE 3885



we are not both-handed is a matter of economy. Life does not like waste. If one thing will do her purpose, Nature does not employ two. When the education of the brain starts, if one side of the brain has the advantage, Nature favours that side. Nature is like a schoolmaster with two boys in his class, one of whom gets a slight start, while the schoolmaster neglects the other altogether.

#### WHY ONLY ONE SIDE OF THE BRAIN NEEDS TO BE EDUCATED

There is no need for both sides of the brain to be equally educated. One side gets an early advantage, and then the more it has, the more is given to it. But it must never be forgotten—though it usually is forgotten—that the less-educated side of the brain is naturally just as good, and has quite equal possibilities of being the leading half, so that there is always this other half of the brain to fall back upon. We must see how this works out.

A man of seventy may meet with some kind of accident or injury, visible or invisible, which prevents the working of the leading half of his brain—the left half, if he is a right-handed man. There is still the right half of his brain available for the same kind of work. With labour and patience, he may be able to teach the right half of his brain to do very imperfectly one or two things which the left half of his brain used to do. But I fear that in cases like this the poor man is almost as badly off as if he had nothing to fall back upon. The reason for this is that when people get old the brain's power of learning becomes less. During youth is the best time to learn. Now let us take the case of a little child of five or thereabouts: he can talk, and perhaps even read a little, he can draw, and even make a few simple letters with his right hand.

#### HOW THE BRAIN REPAIRS AN ACCIDENT TO ITSELF

Some accident may affect the working of the child's brain, just as in the case of the old man, but the difference between the two cases is tremendous. The right half of the little boy's brain now simply takes the lead. It is true that, as we shall learn, he has to begin again by saying "Papa" and "Mamma," just like a tiny baby, but yet, because his brain is young and still developing, a child

like this will, in a year or two, be practically as well off as if the accident had never happened at all. Such cases are not very common, but they are quite well known.

But we have still set ourselves some questions which must be dealt with. We have already decided why people do not become both-handed, unless, like the pianist, they have some special reasons for setting both sides of the brain to learn the same lesson. But we still have to find out why there are about ten or more right-handed people to one who is left-handed, and the puzzle is greater because, as we have seen, there is nothing to be found in the brain itself to explain this difference.

Well, in the first place, it is certain that custom, tradition, and prejudice have something to do with the difference between the numbers of right-handed and left-handed persons. It is probable that a very considerable number of children, at any rate, are born with no natural bias in favour of either hand.

#### RIGHT-HANDED PEOPLE AND LEFT-HANDED PEOPLE

It is interesting to make observations on babies in this respect. Often it is impossible to make out that they prefer the use of one hand to that of another, but when we begin to teach them things, we usually favour the right hand, in other words, it is the left half of the brain that gets all the practice and education, and so it gets the lead. We notice this in games as in everything else.

Among cricketers drawn from the less wealthy classes of society, it is found that many throw, bowl, and catch with the left hand, but they bat right-handed. Many of these were, I believe, naturally left-handed. They preferred to throw with the left hand long before they started cricket, but when they began to be taught to use a bat, they were told to stand in a right-handed position. In cricketers drawn from the upper classes, it is very seldom that we find left-handed players, and especially left-handed batsmen. The reason is that as boys they were specially looked after from the first, and even those who would naturally have become left-handed have been made right-handed. When we notice things like this, we can understand that a great many of the estimates which



out of action by anything, the person will hear perfectly, but only as a child hears, or as we hear an unknown language. There is good evidence to show that, where people know more languages than one, the understanding of them is not all mixed up in one particular part of the brain, but that they have their own little centres, developed by education, situated near or on the outskirts of the ordinary hearing centre in the leading half of the brain, whether that happens to be the right or the left.

#### WHY WE SOMETIMES HEAR WORDS WITHOUT UNDERSTANDING THEM

We have all noticed that sometimes, when we are not attending to the talk of those around us, we hear that something has been said, but do not understand it, and so perhaps we say "I beg your pardon", and before our friend has time to repeat what he said, we have understood it. The words were recorded and heard in the hearing part of the brain, but the reason why we did not "take in" what was said was that the sounds had not been *taken* from that part to the word-hearing centre, where alone they could be interpreted. A second later, when we attended, that happened. A case like this helps us to understand not only the working of the brain, but also what is meant by attention.

In the case of music, too, it is one thing merely to hear, and another to understand. In this case, also, it seems that there is a special centre developed in connection with, and close to, the hearing centre in the leading half of the brain. The brains of some well-known composers have been examined after their death, and it seems clear that some of them have a specially rich development of the cells in this part of the brain.

#### THE MANY LESSONS WE COULD LEARN BY EXAMINING A GREAT MAN'S BRAIN

It is worth while to note, in passing, that a valuable service is rendered to future generations when a great man whose brain has already been invaluable to humanity, gives orders that, when he dies, his brain may be examined, so as to add to our knowledge of this most wonderful of all wonderful things. In point of fact, we are only just at the earliest beginnings of our knowledge of the brain and its working. We know a little of the brain in general, but we have practically everything yet to

learn as to the all-important and endless differences between one brain and another. At present the study has almost entirely to be made upon brains of persons who were not at all noteworthy, but our biggest need is to study the brains of great and unusual people.

It is known that not a few of the wisest of living men have given orders that, after their death, their brains are to be examined for the advancement of knowledge. We have yet to learn all about the brains of people of great general ability—people who are very clever with figures, artistic people, musical people, clever writers, great thinkers, and so on. There is an extremely interesting theory about the finest kinds of brain, which we shall learn in a little while.

Now let us turn to the case of seeing. We are certain that things are seen perfectly on both sides of the brain, but we know that in right-handed people, for instance, it is only in the left half of the brain that reading is accomplished. If the word-seeing centre is thrown out of order, the person will see as well as ever he did in his life, but he could make perfect copies on a piece of paper of the letters he has in front of him, but they mean no more to him than to a baby.

#### A SENSE THAT IS GREATER IN MAN THAN IN ANY OTHER CREATURE

It is also probable—though we do not yet know this for certain—that, just as is true in the case of music, the higher kinds of seeing are done in the leading half of the brain. It may be that the kind of seeing done by the artist is done by the leading half of the brain. According to some students, it may even be that we also appreciate colour in the leading half of the brain.

This is a subject about which we have yet a great deal to learn. It is possible, however, to find out, in a given brain, very precisely what are the exact limits of the seeing area, which, as we know, is at the very back part of the new brain. Now, we find that this seeing area has been growing, so to speak, for ages past in the main line of progress of animal life, and that it is much larger in man than in any other creature; it also varies very largely in different human beings. In the brains of many idiots, and also in the brains of some of the lowest savages, we find very notably that the vision area is small compared





the rest of his brain may be commonplace, or it may be the other way round. We have all heard what was said of the poet, Oliver Goldsmith: "Who wrote like an angel, and talked like poor Poll."

One of the few really great poets of the last half century, who wrote many poems which will be read as long as English is read, was a most stupid and hesitating and commonplace talker. This proves that the speech area of the brain, like other areas of the brain, is an extremely independent thing.

#### THE POWER TO TALK, WHICH CAN MAKE FOR GOOD OR FOR EVIL

This has a very great importance for any nation that is governed as we are governed. The meaning of the word Parliament is the place where people talk; we all know that *parler* is the French for "to speak." Now, everyone who votes for members of Parliament ought to know that the mere power to talk, though it is a very notable thing, and may be a very useful thing, and has often altered the history of nations for good, has yet often altered their history for evil, and so helped to destroy them.

The wise, strong, priceless man may be silent, it is even possible that he may be so busy thinking that he has not time to speak! Wise people who look around them know all these facts, but the interesting thing is that our modern knowledge of the brain, and especially what we are learning as to the independence of the different parts of the brain, and the way in which they vary in different people, independently of each other, all teach us the same lesson. It will be a very good thing when all of us who have a share in deciding who shall govern us use our educated judgment in this very important matter.

#### THE DIFFERENCE BETWEEN FINE BRAINS AND COMMON ONES

And now we may consider a theory which probably helps us to explain in some degree the difference between fine brains and common ones. There would certainly be a great difference between a pianist who always practised with one hand only, and always with the same hand, and another pianist who practised with both hands. If those two sat down one after the other to play a great piece of music, everyone would know the difference. Again, it can be proved

that it makes a great difference to people whether they use only one eye in looking about them, or whether they use two. In the case of those people who do not see straight, or in people whose eyes are very unequal, which is more common, we find that the constant use of one eye only greatly deprives them of the power of judging distances, of seeing perspective, and of realising the depth and solidity of things.

Anyone who has ever looked through a stereoscope knows what a tremendous difference it makes to look at an ordinary photograph, and then to look at a stereoscopic view, using both eyes. When we use both eyes, that is a case of what is called binocular vision. A very wise man, called Dr. John Brown, who wrote "Rab and His Friends," suggested many years ago that some people seem to differ from others as if their thinking were, so to speak, binocular, and so they saw the perspective and depth of things. This is a rather good idea. Herbert Spencer, also, had the same idea as Dr. Brown, but, as he was a great student of the mind and the brain, he was able to develop the idea.

#### GREAT THINKERS, WHO USE BOTH SIDES OF THE BRAIN

He suggested that in good thinkers the two sides of the brain were probably used together much more than in ordinary people. When we look at the huge bundle of fibres that run across from one side of the brain to the other, we can see the force of this. Some day it may be proved that Herbert Spencer's theory is true, not only of thinking, but also of understanding and creating poetry and music, beautiful pictures, and so forth. One of the deeply interesting questions yet to be decided, probably by the present generation, is how far and in what ways, by our education of the young, we can develop to the utmost both sides of the brain, without waste of power and without lowering the quality of the education of both sides. This last is a most important point. There is nothing gained if we educate both sides of the brain to a lower standard than we could reach if we worked on one side. We must be content to let one half of the brain lead and the other be led.

The next part of this is on page 3867

## JACK AND THE BEANSTALK

As soon as the ogre was safely asleep, Jack jumped up, seized the harp and flew out of the room. But the harp was a fury harp and directly Jack picked it up it shrieked out:

'Master! Master!'

The ogre woke up instantly. He started up and seeing what had

that there was not a moment to be lost.

'Mother! Mother! Bring the hatchet!

The ogre's coming down, he shrieked.

Out rushed Jack's mother. Jack

seized the hatchet and with a

blow cut the bean stalk right through.

Down fell the ogre with a frightful

crash and so ended his wretched life.



WILL JACK EAT THE OGRE IN THE MORN'G? HE CAN'T AT A COME MOTHER

The ogre sat at the table, eating the large, round, baked item. He was holding a knife and looking down at his food with a satisfied expression. On the table were a bottle of sauce, a glass, and a small plate. In the background, a woman (Jack's mother) was standing near a doorway, looking on. A large beanstalk was visible behind the ogre, and a window showed a view of the outdoors.

Jack trembled at the voice of the ogre. "Nonsense, my dear!" he heard the wife say. "See what a fine supper I have prepared for you!"

The supper was so good that the ogre instantly sat down and made a good meal, and when he had finished he told his wife to bring in his favourite hen. She went outside, and returned with a beautiful hen, which she set down on the table.

"Lay an egg!" commanded the ogre; and the hen instantly laid a golden egg. "What a useful bird!" thought Jack.

Soon after this the ogre fell asleep, and snored so loudly that his snores shook the walls. As soon as Jack heard them, he crept out of his hiding-place, picked up the hen, and ran away. On and on he ran until he reached the bean-stalk, which he climbed down as fast as ever he could go. When he reached the bottom he flew to his mother and told her what had happened. The widow was overjoyed, and called Jack her "brave boy." They sold the golden eggs which the wonderful hen had laid, and lived very comfortably for some time on the money they were able to get for them.

But after a while Jack began to long for more adventures. So one day he disguised himself as well as he could, climbed up the bean-stalk, found his way to the castle, and again asked the ogre's wife to give him food and lodging. But the woman shook her head, and said that the last time she had befriended a poor boy the ungrateful wretch had repaid her by stealing the ogre's favourite hen. But Jack begged so hard that at last she consented, and this time hid him in a cupboard.

Presently the ogre returned to the castle. As he entered the kitchen, he cried out in a terribly loud voice:

"Wife, I smell fresh meat!"

"Nonsense, my dear!" replied his wife, as before. "See what a fine supper I have prepared for you."

The ogre sat down and ate his supper. When he had finished, he roared:

"Bring me my money-bags!"

His wife brought the bags, and laid them on the table. The ogre counted his money, put the coins back into the bag, and then fell asleep.

Out jumped Jack, caught up the money-bags, ran out of the castle, and was soon back again in the cottage.

"You need not mind spending all this money, mother," he said, pulling the bags out of his pockets one after the other, "for that bad man stole it from my father, and it is all our own."

Some time after this Jack once more climbed the bean-stalk and made his way to the castle. This time he dare not let the ogre's wife catch sight of him, but after waiting about for some hours he managed to slip in and conceal himself in the

copper just before the ogre returned.

"Wife, I smell fresh meat!" roared the ogre, directly he set foot in the kitchen.

"Oh, no!" replied his wife. "You are always fancying there is someone in the house. This time I am certain you are mistaken."

When the ogre had eaten his supper, he called for his harp. His wife brought it and set it on the table, and at a word from the ogre it began playing by itself. This so pleased Jack, who was peeping over the top of the copper, that he determined to have it



Jack reached the bean-stalk, and began to climb down it quickly with the harp, while the ogre followed in hot pursuit.

As soon as the ogre was safely asleep Jack jumped up seized the harp and flew out of the room. But the harp was a fairy harp and directly Jack picked it up it shrieked out

Master! Master!

The ogre woke up instantly. He started up and seeing what had

that there was not a moment to be lost. Mother! Mother! Bring the hatchet. The ogre's coming down. He tricked. Out rushed Jack's mother. Jack seized the hatchet and with a single blow cut the bean stalk right through. Down fell the ogre with a frightful crash and so ended his wretched life.



WHEN JACK SAW IT WAS IN THE EVEN HE WENT AT A FINE MOTHER

Jack and his mother were in the kitchen. Jack was sitting at the table eating a large meal. His mother was standing behind him, looking on. On the table were a plate of food, a bottle, and a glass. In the background, there was a window with a view of a landscape and a door.

# HOW TRUTH GOT TO THE BOTTOM OF A WELL

Ding, dong, bell!

Tommy Lin let go his hold, and Pussy descended with a rush into the darkness of the well.

"Pussy's in the well!" screamed everybody on top.

"Who threw her in?" squeaked the mice.

"Little Tommy Lin," cawed the rooks.

And while they shouted on top, Pussy fell, and fell, and fell.

"Now for the bump," she sighed, as the dark and oily floor of the well rushed up at her through the water.

But instead of a bump, she fell into the lap of a Spinster, who was sitting on a marble bench, with a little lamp burning at her side. The Spinster looked calmly down on Pussy, fondled her ears, and stroked her soft fur, and smiled at her.

"Well, I never!" said Pussy. "How did you get here? Did that little rascal of a villain, Tommy Lin, throw you in, too?"

The Spinster shook her head.

"Who are you?" asked Pussy.

"I am called Truth."

"Indeed! And how did you get here, pray?"

"Democritus placed me where you found me."

"And who was he, to be sure? Grandfather of Tommy Lin, I'll be bound!"

"Democritus," replied Truth, "was one of the greatest philosophers of antiquity. He devoted his life to

discovering facts. Instead of living in Athens and enjoying himself like the other philosophers, he spent his days in searching for facts. He journeyed to Europe, Asia, and Africa—all to get facts. And when he got back to his native city of Abdera, he took up his dwelling in a cave in a garden just outside the city, and there spent his life laughing at the foolish notions of ignorant people."

"Did he, though?"

"The people thought he was mad, and sent the learned doctor Hippocrates to have a talk with him. But when Hippocrates came away, he said that it was not Democritus who was mad, but his accusers. Democritus, he said, did quite right to laugh at the absurdities and follies and stupidities of ignorant, superstitious people. It was a mad world. Democritus was about the only sane man alive."

"If I had my way with the human race," said Pussy, "I wouldn't laugh at them, but I'd convert the whole lot of them into mice, and say to my family: 'Enjoy yourselves!'"

"The human race has learned a great deal since Democritus," replied Truth, "and you mustn't judge them from your experience of Tommy Lin. They are trying their best. And though they keep me here in this dark, gloomy, and hidden place, you will certainly never hear me express any feeling for them except the feeling of pity."

"Why did Democritus place you here?"



THE SPINSTER LOOKED CALMLY DOWN ON PUSSY, AND STROKED HER SOFT FUR



# THE TALES OF UNCLE REMUS

FOLK STORIES are the tales told among the natives of different parts of the world—tales which have been told as long ago as people can remember. Their authors are unknown, for these old, old stories have grown gradually by being told over and over again for generations. It was left to an American writer, Joel Chandler Harris, who died in 1908, to prove that the negro people of America have as quaint and interesting folk stories as any other race. Their stories are chiefly about the doings of animals, such as the fox, the rabbit, and the wolf. "Uncle Remus," who is supposed to tell these stories is an old negro slave. Mr. Harris wrote many books full of these delightful tales, in the quaint, broken, English spoken by the negroes, and here we give some of his stories in words that are easy to read.

## BRER RABBIT AND BRER FOX

**B**REER RABBIT was a naughty, cunning little creature, and as saucy as a jay-bird. He was always playing tricks on his neighbours and they were always trying to catch him. But it wasn't by any means an easy task to catch Brer Rabbit. One day Brer Wolf says to Brer Fox:

"If we don't get that little varmint for supper to-night," says he, "I'll give up being a wolf, and eat grass. You just run along home and get into bed, and make out you're dead," says he. "And don't you say anything till Brer Rabbit comes and puts his hands on you. Then we'll get him right enough."

So Brer Fox went home and got into bed, and Brer Wolf he marched off to Brer Rabbit's house, and knocked at the door.

"Bad news, Brer Rabbit," says Brer Wolf. "Poor Brer Fox died this morning, and I'm off to arrange the funeral," says he.

Brer Wolf trotted away, and Brer Rabbit went round to Brer Fox's house to see what he could see. He peeped in, and there was Brer Fox stretched out on the bed stiff as a poker, looking just as if he was dead. But Brer Rabbit was always too wide-awake to be easily deceived, and he says out loud, as if talking to himself:

"Poor old Brer Fox! I hope he isn't dead, but I expect he is. I'd better sit here till the neighbours come

round. But I wonder if he's really dead," says Brer Rabbit in a kind of doubtful way. "Doesn't look like it," says he. "You can always tell when a fox is dead by the way he keeps shaking his hind leg," says he.

When Brer Fox heard this, he thought he'd show he was really dead, and began shaking his hind leg, and as soon as Brer Rabbit saw it he tore out of the house as fast as he could, and did not stop till he reached the safety of his own home. Brer Fox and Brer Wolf had to go to bed without any supper that night.

## BRER RABBIT AND MR. BEAR

**B**REER FOX used to grow peas in his garden, and Brer Rabbit used to creep through a hole in the hedge and steal the peas. So Brer Fox made a



MR. BEAR FINDS BRER RABBIT

mighty cunning trap. A young tree was growing just above the hole. Brer Fox bent this down, and tied a rope to the top of it. Then he made a loop-knot at the end of the rope, and fixed this over the hole by means of a stick.

The next morning Brer Rabbit popped through the hole, and knocked the stick away. The loop-knot caught him by the hind legs, the tree flew up, and there was Brer Rabbit dangling high up in the air. By-and-by Mr. Bear came along.

"Whatever are you doing up there," says Mr. Bear.

"Making a dollar a minute—a dollar a minute," says old Brer Rabbit.



BRER FOX WAS STRETCHED ON THE BED

How are you doing, that? says Mr Bear very much interested

A dollar a minute says Brer Rabbit That is what Brer Fox is paying me to hang up here and keep the crows away from his pea says he

A dollar a minute! But I've plenty of work of my own to do and I can have this job if you like Mr Bear says he

Mr Bear said that he'd like the job and Brer Rabbit showed him how to bend down the tree and it was all up before Mr Bear was swinging up in Brer Rabbit's place Soon afterward out comes Brer Fox with a great big stick

So it's you Mr Bear that comes stealing my peas is it? says Brer Fox

You did that! I'll teach you to break into my garden! says he

And he gave poor Mr Bear the thrashing that cunning old Brer Rabbit ought to have had

### THE CHEAT RACE

**B**REX RABBIT came to feel a himself just all out the cunningest creature alive But he did not get the best of old Brer Tortoise Brer Rabbit said to Brer Tortoise

You're a mighty old crawler If we had a race I'd be all to you



and he'd be all to you says he and he'd be all to you says he and he'd be all to you says he

Brer Rabbit says to Brer Tortoise You're a mighty old crawler If we had a race I'd be all to you says he and he'd be all to you says he and he'd be all to you says he

his wife by the starting post a son at each of the first four nail posts and he crouched himself down at the winning post

By and by Brer Rabbit arrived and seeing Mrs Tortoise in the water he cried

heady? Go

And Mrs Tortoise did go She went home At the first nail post Brer Rabbit saw the young Tortoise

Calls says Brer Rabbit Old Brer Tortoise sways pretty fast

When he found the Tortoise at the second post and then at the third and then at the fourth he began to feel very fast

But he got up in a good way He got his ear back and did the last mile like a dash of hot milk As he came puffing up towards the winning post all the people of Brer Tortoise from behind

thought he was not coming Brer Rabbit said Brer Tortoise been having a rest on the way I have a lot says he for him and for me to take a little longer to do it

Now Brer Rabbit let him himself out a little longer off back and out and out and out and out

### BREX RABBIT AND MISS COB

**B**REX RABBIT was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow

He was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow

He was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow a fellow that was a very fine fellow



BRER RABBIT AND MISS COB



Miss Cow butted and butted, and got her horns jammed in the tree, and she couldn't get away. Brer Rabbit scooted off, and returned with his wife and children, all carrying pails, and they milked Miss Cow dry.

"You'll have to stay here all night, Miss Cow," says Brer Rabbit very politely. "But don't worry; I'll come and milk you again in the morning."

But in the morning Miss Cow got her horns free, and she laid a trap for Brer Rabbit. After a good feed of grass, she returned to the apple-tree and stuck her horns back in the holes. Brer Rabbit, however, was up very early that day, and he saw what Miss Cow did.

"I haven't had any rest all night," says Miss Cow. "Brer Rabbit, do

catch hold of my tail and help me pull my horns out."

"No," says Brer Rabbit. "You do the pulling and I'll do the groaning."

Miss Cow jerked out her horns, dashed after Brer Rabbit. Helter-skelter they went down the road. But Brer Rabbit kept on gaining, and he darted into some bushes; and when Miss Cow came up, there was he with his head just sticking out, and his eyes looking as big as saucers.

"Hello, Big Eyes!" says Miss Cow. "Seen Brer Rabbit go by here?"

"Just this minute," says Brer Rabbit. "He was looking mighty sick and tired."

Off Miss Cow went like mad, and Brer Rabbit he rolled on the ground and laughed till his sides ached.

## LA SORCIÈRE DE LA FORET

THE ENGLISH VERSION OF THIS STORY IS GIVEN ON PAGE 157

LE Prince Mirko était le fils d'un Roi de Hongrie. Son père mourut dans une bataille avec les Tartares, et Mirko dût fuir pour sauver sa vie. Après avoir voyagé à cheval pendant sept jours, il arriva à un palais fait de diamants. La nuit était profonde et Mirko était fatigué et avait faim. Il passa bravement la grille du palais, et fut surpris de n'y trouver aucun être vivant. Il y avait un excellent dîner dans la salle à manger, et après avoir mangé, le Prince Mirko entra dans une chambre à coucher et s'endormit. Il avait à peine fermé les yeux que sept géants, de terribles Tartares, pénétrèrent bruyamment dans le palais.

"Ho, ho!" s'écria le plus grand, "je sens du sang chrétien!" Et, se jetant sur Mirko, il le dépeça en petits morceaux, qu'il jeta par la fenêtre. Le lendemain, une jolie petite fille sortit de sa cachette sous le palais et arrosa les morceaux avec l'élixir de Vie. Mirko aussitôt se dressa, plus fort et plus beau qu'auparavant et la jolie fillette disparut.

"Ho, ho!" s'écria le plus grand des Tartares, "le petit Prince est revenu à la vie!" Et de nouveau il coupa Mirko en morceaux. Le lendemain, tout se passa de même. Le troisième jour, la belle fillette versa encore l'élixir de Vie sur Mirko, et lui dit: "Je suis la Princesse de ce château. Les Tartares ont tué mon père. Mais je

n'ai plus besoin de me cacher, car vous êtes plus fort qu'eux tous."

Et c'était vrai. D'un coup de son épée il tua les sept Tartares, et lui et la Princesse se mirent à la recherche de leurs pères, afin de verser sur eux l'élixir de Vie. La nuit, ils pénétrèrent dans une forêt et allumèrent un feu sous un arbre.

"Comme il fait froid!" dit une voix, au-dessus.

Ils levèrent la tête et virent une sorcière Tartare assise dans l'arbre.

"Jetez cette poudre sur le feu," dit la sorcière, "et il brûlera mieux."

Mirko obéit, une étrange fumée s'éleva, et la sorcière descendit en disant:

"Vous avez tué mes enfants, les sept Tartares, c'est votre tour de mourir maintenant!"

Mirko se sentit influencé magiquement, et supplia la Princesse de l'aider. Mais la fumée l'avait vaincue aussi. Mirko avait l'élixir de Vie, et il en versa un peu sur elle et sur lui-même; puis, ils saisirent la sorcière et la forcèrent à les mener à l'endroit où leurs pères étaient enterrés.

"Il me semble que j'ai dormi bien longtemps," dit le vieux roi en se frottant les yeux, au moment où l'élixir le toucha. Le père de la Princesse dit la même chose.

Bientôt après, Mirko épousa la Princesse, son père renonça au trône et les fit Roi et Reine.



## THE MAN WHO CARRIED DEATH

FORTUNATELY the large shell from the Russian line. The fuse was burning and in a moment or two the whole battery must have been blown to pieces. The men stopped in their work and looked at the shell as though fascinated expecting, even, would that the shell would burst and destroy them.

But Captain Lee was a man of action and of the greatest presence of mind. Without a moment's loss of time or a thought of his own safety he rushed across the battery, seized the shell and ran with it to the edge of the battery.

During the Crimean War a gallant deed of this kind was performed by Captain William Lee, the commander of one of the British warships. When he had landed to take part in the battle of the Tchernaya, Captain Lee and his men were sent to a certain spot where the Russians were lying in wait. As the British ships were not yet ready to fire, the British soldiers were ordered to take up their positions. Captain Lee and his men were sent to a certain spot where the Russians were lying in wait. As the British ships were not yet ready to fire, the British soldiers were ordered to take up their positions. Captain Lee and his men were sent to a certain spot where the Russians were lying in wait. As the British ships were not yet ready to fire, the British soldiers were ordered to take up their positions.

The other men of the battery were so frightened and excited that they were unable to do anything. Captain Lee, however, was a man of action and of the greatest presence of mind. Without a moment's loss of time or a thought of his own safety he rushed across the battery, seized the shell and ran with it to the edge of the battery. He then threw the shell into the air and it exploded, killing the Russian soldiers and destroying their battery.

# THE PICTURE OF A GOLDEN DEED

A YOUNG Scotch minister went one day to visit the birthplace of Thomas Chalmers in an ancient and obscure town on the Firth of Forth. When he had examined this house, he and his companion entered an inn for refreshment.

The room into which he was shown had its walls covered by absurd pictures, such as shepherdesses with crooks and sailors home for the holidays. But over the mantelpiece was a picture of quite another kind, making a very strange contrast with the rest. This picture represented the gloomy interior of a cobbler's shop. The cobbler was seated on his stool—an old man with spectacles pushed up over his brow, a shoe between his knees, and a hammer in his hand. The massive forehead and firm mouth



JOHN POUNDS, OF PORTSMOUTH

suggested strength of character and an iron resolution. But under his bushy eyebrows two of the kindest eyes in all the world beamed with benevolence on a half-circle of ragged boys and girls grouped before the old man with lesson-books in their hands. The young Scotch minister read the inscription, which told how John Pounds, a cobbler in Portsmouth, took pity on the multitude of poor ragged children left by ministers and magistrates, and ladies and gentlemen, to go to ruin in the streets; how, like a good shepherd, he gathered in the wretched outcasts, how he trained them to God and to the world, and how, while earning his daily bread by the sweat of his brow, he had rescued from misery and saved to society not less than five hundred of these children. The young minister was the famous Dr. Guthrie, and this humble picture of

John Pounds led him to become the apostle of the Ragged School movement. "I felt ashamed of myself," he related afterwards. "I well remember saying to my companion 'That man is an honour to humanity, and deserves

the tallest monument ever raised within the shores of Britain.' I took up that man's history, and I found it animated by the Spirit of Him who had compassion on the multitude."

John Pounds was a clever man besides, and, like Paul, if he could not win a poor boy any other way, he won him by art. He would be seen chasing a ragged boy along the quays, and compelling him to come to school, not by the power of a policeman, but by the power of a hot potato.

He knew the love an Irishman had for a potato, and John Pounds might be seen running, holding one under the boy's nose, like an Irishman, very hot, and with a coat as ragged as himself. When the day comes when honour will be done to whom honour is due, we can fancy the crowd



THE PICTURE THAT HELPED DR. GUTHRIE  
I saw the painting in the possession of Sir John Kirk

of those whose fame poets have sung, and to whose memory monuments have been raised, dividing like the wave, and, passing the great and the noble and the mighty of the land, this poor obscure old man stepping forward and receiving the especial notice of Him who said: "Inasmuch as ye have done it unto one of the least of these my brethren, ye have done

it unto Me." This is an example of the great influence of a picture. In seizing upon the imagination of Dr. Guthrie, this picture became an important influence in the lives of thousands of men and women.

The next Golden Deeds are on page 3883

The Childs Book of  
POETRY

A GREAT POEM OF BRITISH HEROISM

In the long and glorious story of British heroism there are few chapters to match in thrilling interest the defence of Lucknow. When an immense number of the native soldiers in India rebelled against the British rule and began that short but fierce struggle with their white masters known as the Indian Mutiny the town of Lucknow was besieged by a great army of rebel soldiers. Within its walls Sir Henry Lawrence commanded a small force of British and loyal native soldiers while a many more men, women, and children were there to be protected. For three terrible months the British held out against their swarming enemies, until Havelock and Outram came to their relief on 29 September 25, 1857. This historic episode in British history was fittingly celebrated in the following fine poem by Lord Tennyson.

## THE DEFENCE OF LUCKNOW

BANNERS of Ireland  
 out for a season  
 to the of Britain  
 ha'th  
 Fleeted in coming battle or rape  
 to the fatherly  
 ever with a wher gove th n when  
 we had craved the in hel  
 Flying at tip of the sea in the  
 ghastly war at Lucknow  
 S'th the a th staff of the halya ' but  
 ver we used there an or  
 And set upon the temporal civil war  
 but of the feeding time

[illegible][illegible]

1. The first step is to identify the main topic of the document. This is often found in the title or the first few paragraphs.

1. 1991 年 12 月 1 日，甲、乙、丙三人共同出资 100 万元，在 A 市设立 B 公司，注册资本为 100 万元，甲、乙、丙三人分别持有 33.33% 的股份。

1. 2019. 12. 1. (수) 14:00 ~ 15:00  
 2. 2019. 12. 1. (수) 15:00 ~ 16:00  
 3. 2019. 12. 1. (수) 16:00 ~ 17:00  
 4. 2019. 12. 1. (수) 17:00 ~ 18:00  
 5. 2019. 12. 1. (수) 18:00 ~ 19:00

Keep the record in hand.  
You can say how the  
country is doing.

Quiet ah quiet we will be  
 part of the peace have lost in ph  
 (like with the park with water and  
 near a gate than last  
 a lot of work and a few and a  
 back to the  
 (a) ever up in the year next  
 summer of Ireland

4r but the fur thing is more or less  
 times and it changes on a way  
 on a that is that a reg ad  
 than's else or on some  
 Mark's with the mark put  
 has no any final without  
 (anyone can make it a  
 a shop  
 but it is not the same  
 more

What is your job? What if that  
you want to be in  
he was at it? What if he was at the  
Biology? What if he was at the  
Lungs and kidneys? What if he was  
we are a

17. Given an array of numbers, find the maximum sum of a subarray.  
 Input: [1, -2, 3, 4, -1, 2, 1, -4, 5] Output: 10  
 Explanation: The subarray [3, 4, -1, 2, 1] has the maximum sum of 10.

[illegible]

"Children and wives—if the tigers leap  
into the fold unawares—  
Every man die at his post—and the foe may  
outlive us at last—  
Better to fall by the hands that they love,  
than to fall into theirs!"

Roar upon roar in a moment two mines, by  
the enemy sprung,  
Clove into perilous chasms our walls and our  
poor palisades

Rifleman, true is your heart, but be sure that  
your hand be as true!

Sharp is the fire of assault, better aimed are  
your flank fusillades—

Twice do we hurl them to earth from the  
ladders to which they had clung,

Twice from the ditch where they shelter, we  
drive them with hand grenades,

And ever upon the topmost roof our banner  
of England blew

Then on another wild morning another wild  
earthquake out-tore

Clean from our lines of defence ten or twelve  
good paces or more

Rifleman, high on the roof, hidden there from  
the light of the sun—

One has leapt up on the breach, crying out,  
"Follow me! Follow me!"—

Mark him—he falls! Then another, and him  
too, and down goes he

Had they been bold enough then, who can tell  
but the traitors had won?

Boardings, and raftings, and doors—an em-  
brasure! Make way for the gun!

Now double charge it with grape! It is  
charged and we fire, and they run

Praise to our Indian brothers, and let the dark  
face have his due!

Thanks to the kindly dark faces who fought  
with us, faithful and few,

Fought with the bravest among us, and drove  
them, and smote them, and slew—

That ever upon the topmost roof our banner  
in India blew

Men will forget what we suffer and not what  
we do We can fight,

But to be soldier all day and be sentinel all  
through the night—

Ever the mine and assault, our sallies, their  
lying alarms,

Bugles and drums in the darkness, and shout-  
ings and soundings to arms,

Ever the labour of fifty that had to be done  
by five,

Ever the marvel among us that one should be  
left alive,

Ever the day with its traitorous death from  
the loopholes around,

Ever the night with its coffinless corpse to be  
laid in the ground,

Heat like the mouth of a hell, or a deluge of  
cataract skies,

Stench of old offal decaying, and infinite  
torment of flies,

Thoughts of the breezes of May blowing over  
an English field,

Cholera, scurvy, and fever, the wound that  
would not be healed,

Lopping away of the limb by the pitiful-piti-  
less knife—

Torture and trouble in vain—for it never  
could save us a life,

Valour of delicate women who tended the  
hospital bed,

Horror of women in travail among the dying  
and dead,

Grief for our perishing children, and never a  
moment for grief,

Toil and ineffable weariness, faltering hopes  
of relief,

Havelock baffled or beaten, or butchered, for  
all that we knew—

Then day and night, day and night, coming  
down on the still shattered walls

Millions of musket-bullets, and thousands of  
cannon-balls—

But ever upon the topmost roof our banner of  
England blew

Hark! cannonade, fusillade! is it true what  
was told by the scout,

Outram and Havelock breaking their way  
through the fell mutineers?

Surely the pibroch of Europe is ringing again  
in our ears!

All on a sudden the garrison utter a jubilant  
shout,

Havelock's glorious Highlanders answer with  
conquering cheers,

Forth from their holes and their hideouts our  
women and children come out,

Blessing the wholesome white faces of Havelock's good fusileers,

Kissing the war-hardened hand of the High-  
lander wet with their tears!

Dance to the pibroch! saved! we are saved!  
is it you? is it you?

Saved by the valour of Havelock, saved by the  
blessing of Heaven!

"Hold it for fifteen days!" we have held it  
for eighty seven!

And ever aloft on the palace roof the old  
banner of England blew

## DEATH

This great sonnet by Dr. John Donne, who was appointed  
Dean of St. Paul's Cathedral in 1621, may be considered in  
the light of the Apostle Paul's triumphant exclamation, "O  
Death, where is thy sting? O Grave, where is thy victory?"  
Death, so far from being the conqueror, will  
itself be laid low. How foolish of Death, then, thus the  
poet argues, to "swell" or pride itself upon its powers, as  
its strength is but an empty boast. Death itself shall die,  
for it is only the gateway to real life, the Life Eternal.

DEATH, be not proud, though some have  
called thee

Mighty and dreadful, for thou art not so,  
For those whom thou thinkest thou dost

overthrow  
Die not, poor Death, nor yet canst thou kill

me  
From Rest and Sleep, which but thy picture

be,  
Much pleasure, then from thee much more

must flow;  
And soonest our best men with thee do go—

Rest of their bones and souls' delivery!  
Thou'rt slave to fate, chance, kings and

desperate men,  
And dost with poison, war, and sickness

dwell,  
And poppy or charms can make us sleep as

well  
And better than thy stroke Why swell'st

thou, then?  
One short sleep past, we wake eternally,

And Death shall be no more Death, thou  
shalt die!

## SALLY IN OUR ALLEY

For being a better known or more popular to the  
 approved he is by the way, and is pretty  
 as you dear y and the other live as a  
 If we like it, it is in the line of a disagree-  
 in persons who make a game of it, and we  
 M. Brown, who is a very good man, and  
 day and Monday. It may be the best of the  
 who died. I was in the same of some of the  
 way. It has been said that he is the best of the  
 Another is the same in his life, and is the best of the

Or all the girls that are so smart  
There's none like pretty Sally  
She is the darling of my heart  
And lives in our alley  
There is no lady in the land  
That's half so sweet as Sally  
She is the darling of my heart  
And lives in our alley

Of all the days within the week  
I love the day that comes between  
A Saturday and a Sunday  
Oh! then I'm dressed in all my best  
To walk abroad with Galy  
She is the darling of my heart  
And lives in our little

When Christ has come about again  
 Oh! then I shall have money  
 I'll save it up and I'll love it all  
 I'll give only my heart  
 And when my seven long years are out  
 Oh! then I'll marry my life  
 And then I'll be happy and I'll live  
 But not in our place

TO ANYONE WHO MAY COMMAND  
HIM ANYTHING

I am a poor P & I have had to go on all  
the time. I thought to be another week or  
two. It has been worse than I could ever imagine.  
I am so tired now that I can't get up at all.  
I am so tired now that I can't get up at all.  
I am so tired now that I can't get up at all.

**B**urns to live a few live  
The first a little  
Or I'll live at live live  
A few live live live

42 art's well about a kind  
 A p all on - go! and free  
 As by the wif we may ill a cant end  
 That being I give out e

1. I have been very busy lately.  
 2. I have been very busy lately.  
 3. I have been very busy lately.  
 4. I have been very busy lately.

1. 1st of 4 pages - 1st of 4 pages - 1st of 4 pages  
 2. 2nd of 4 pages - 2nd of 4 pages - 2nd of 4 pages  
 3. 3rd of 4 pages - 3rd of 4 pages - 3rd of 4 pages  
 4. 4th of 4 pages - 4th of 4 pages - 4th of 4 pages

I need more info 17th Apr  
 I am off to the museum for  
 the 2nd time. 20th Apr. 10  
 I will stay at the 1st

7.  $\log_2 16 = 4$  and  $\log_2 32 = 5$   
 $2^4 = 16$  and  $2^5 = 32$   
 $2^{4+1} = 2^5$  and  $2^{5+1} = 2^6$   
 $2^6 = 64$  and  $2^7 = 128$

JENNY KISS D ME

Length 1. throat brown all the way - red down of his breast  
and breast - chest - the red in his throat was a pale  
- seems almost to have been - light and blue - the red  
a pale or near of (Chorus) faintly, though not  
several - a leaf of the - (Chorus) - (Chorus) -  
he is not a very or a - a light and happy -  
had these - (Chorus) - (Chorus) -  
place - (Chorus) - (Chorus) -  
nothing - (Chorus) - (Chorus) -

Jimmy kissed me when we met  
 Jumpin' from the chair he sat in  
 Tossin' you that you love to get  
 Sweetie into your list put that in!  
 Say I'm weary say I'm sad  
 Say that heart and wea't have miss I'm  
 Say I'm grown old but ad!  
 Jimmy kiss me

## DAYBREAK

[illegible]

A wave came up out of the sea. [The  
And as I ... On it ...

It has no other and that  
 You cannot be a part of it

And hurried up two I far away  
Crying      Awake      It's there, it's there

It said we are the forest & you  
are a part of it

He suggested the way I should follow  
And said, "O! I awake and see."

And a few farms (1) claim to be  
some of the best in the country.

It is possible to find the  
"How" own and the "What" of the

It is not the only thing that is true  
- that the only thing that is true is that

It contains 12 pages and is written in  
Arabic script. It is a very old manuscript.

## THE DALLIAN

[illegible]

1. The first step is to identify the problem or goal. This involves understanding the current situation and what needs to be achieved.

1. 1990-1995년 동안의 평균 기온은 15.2°C로, 1996-2000년 동안의 평균 기온은 16.5°C로, 2001-2005년 동안의 평균 기온은 17.8°C로, 2006-2010년 동안의 평균 기온은 19.1°C로, 2011-2015년 동안의 평균 기온은 20.4°C로, 2016-2020년 동안의 평균 기온은 21.7°C로, 2021-2025년 동안의 평균 기온은 23.0°C로, 2026-2030년 동안의 평균 기온은 24.3°C로, 2031-2035년 동안의 평균 기온은 25.6°C로, 2036-2040년 동안의 평균 기온은 26.9°C로, 2041-2045년 동안의 평균 기온은 28.2°C로, 2046-2050년 동안의 평균 기온은 29.5°C로, 2051-2055년 동안의 평균 기온은 30.8°C로, 2056-2060년 동안의 평균 기온은 32.1°C로, 2061-2065년 동안의 평균 기온은 33.4°C로, 2066-2070년 동안의 평균 기온은 34.7°C로, 2071-2075년 동안의 평균 기온은 36.0°C로, 2076-2080년 동안의 평균 기온은 37.3°C로, 2081-2085년 동안의 평균 기온은 38.6°C로, 2086-2090년 동안의 평균 기온은 39.9°C로, 2091-2095년 동안의 평균 기온은 41.2°C로, 2096-2100년 동안의 평균 기온은 42.5°C로, 2101-2105년 동안의 평균 기온은 43.8°C로, 2106-2110년 동안의 평균 기온은 45.1°C로, 2111-2115년 동안의 평균 기온은 46.4°C로, 2116-2120년 동안의 평균 기온은 47.7°C로, 2121-2125년 동안의 평균 기온은 49.0°C로, 2126-2130년 동안의 평균 기온은 50.3°C로, 2131-2135년 동안의 평균 기온은 51.6°C로, 2136-2140년 동안의 평균 기온은 52.9°C로, 2141-2145년 동안의 평균 기온은 54.2°C로, 2146-2150년 동안의 평균 기온은 55.5°C로, 2151-2155년 동안의 평균 기온은 56.8°C로, 2156-2160년 동안의 평균 기온은 58.1°C로, 2161-2165년 동안의 평균 기온은 59.4°C로, 2166-2170년 동안의 평균 기온은 60.7°C로, 2171-2175년 동안의 평균 기온은 62.0°C로, 2176-2180년 동안의 평균 기온은 63.3°C로, 2181-2185년 동안의 평균 기온은 64.6°C로, 2186-2190년 동안의 평균 기온은 65.9°C로, 2191-2195년 동안의 평균 기온은 67.2°C로, 2196-2200년 동안의 평균 기온은 68.5°C로, 2201-2205년 동안의 평균 기온은 69.8°C로, 2206-2210년 동안의 평균 기온은 71.1°C로, 2211-2215년 동안의 평균 기온은 72.4°C로, 2216-2220년 동안의 평균 기온은 73.7°C로, 2221-2225년 동안의 평균 기온은 75.0°C로, 2226-2230년 동안의 평균 기온은 76.3°C로, 2231-2235년 동안의 평균 기온은 77.6°C로, 2236-2240년 동안의 평균 기온은 78.9°C로, 2241-2245년 동안의 평균 기온은 80.2°C로, 2246-2250년 동안의 평균 기온은 81.5°C로, 2251-2255년 동안의 평균 기온은 82.8°C로, 2256-2260년 동안의 평균 기온은 84.1°C로, 2261-2265년 동안의 평균 기온은 85.4°C로, 2266-2270년 동안의 평균 기온은 86.7°C로, 2271-2275년 동안의 평균 기온은 88.0°C로, 2276-2280년 동안의 평균 기온은 89.3°C로, 2281-2285년 동안의 평균 기온은 90.6°C로, 2286-2290년 동안의 평균 기온은 91.9°C로, 2291-2295년 동안의 평균 기온은 93.2°C로, 2296-2300년 동안의 평균 기온은 94.5°C로, 2301-2305년 동안의 평균 기온은 95.8°C로, 2306-2310년 동안의 평균 기온은 97.1°C로, 2311-2315년 동안의 평균 기온은 98.4°C로, 2316-2320년 동안의 평균 기온은 99.7°C로, 2321-2325년 동안의 평균 기온은 101.0°C로, 2326-2330년 동안의 평균 기온은 102.3°C로, 2331-2335년 동안의 평균 기온은 103.6°C로, 2336-2340년 동안의 평균 기온은 104.9°C로, 2341-2345년 동안의 평균 기온은 106.2°C로, 2346-2350년 동안의 평균 기온은 107.5°C로, 2351-2355년 동안의 평균 기온은 108.8°C로, 2356-2360년 동안의 평균 기온은 110.1°C로, 2361-2365년 동안의 평균 기온은 111.4°C로, 2366-2370년 동안의 평균 기온은 112.7°C로, 2371-2375년 동안의 평균 기온은 114.0°C로, 2376-2380년 동안의 평균 기온은 115.3°C로, 2381-2385년 동안의 평균 기온은 116.6°C로, 2386-2390년 동안의 평균 기온은 117.9°C로, 2391-2395년 동안의 평균 기온은 119.2°C로, 2396-2400년 동안의 평균 기온은 120.5°C로, 2401-2405년 동안의 평균 기온은 121.8°C로, 2406-2410년 동안의 평균 기온은 123.1°C로, 2411-2415년 동안의 평균 기온은 124.4°C로, 2416-2420년 동안의 평균 기온은 125.7°C로, 2421-2425년 동안의 평균 기온은 127.0°C로, 2426-2430년 동안의 평균 기온은 128.3°C로, 2431-2435년 동안의 평균 기온은 129.6°C로, 2436-2440년 동안의 평균 기온은 130.9°C로, 2441-2445년 동안의 평균 기온은 132.2°C로, 2446-2450년 동안의 평균 기온은 133.5°C로, 2451-2455년 동안의 평균 기온은 134.8°C로, 2456-2460년 동안의 평균 기온은 136.1°C로, 2461-2465년 동안의 평균 기온은 137.4°C로, 2466-2470년 동안의 평균 기온은 138.7°C로, 2471-2475년 동안의 평균 기온은 140.0°C로, 2476-2480년 동안의 평균 기온은 141.3°C로, 2481-2485년 동안의 평균 기온은 142.6°C로, 2486-2490년 동안의 평균 기온은 143.9°C로, 2491-2495년 동안의 평균 기온은 145.2°C로, 2496-2500년 동안의 평균 기온은 146.5°C로, 2501-2505년 동안의 평균 기온은 147.8°C로, 2506-2510년 동안의 평균 기온은 149.1°C로, 2511-2515년 동안의 평균 기온은 150.4°C로, 2516-2520년 동안의 평균 기온은 151.7°C로, 2521-2525년 동안의 평균 기온은 153.0°C로, 2526-2530년 동안의 평균 기온은 154.3°C로, 2531-2535년 동안의 평균 기온은 155.6°C로, 2536-2540년 동안의 평균 기온은 156.9°C로, 2541-2545년 동안의 평균 기온은 158.2°C로, 2546-2550년 동안의 평균 기온은 159.5°C로, 2551-2555년 동안의 평균 기온은 160.8°C로, 2556-2560년 동안의 평균 기온은 162.1°C로, 2561-2565년 동안의 평균 기온은 163.4°C로, 2566-2570년 동안의 평균 기온은 164.7°C로, 2571-2575년 동안의 평균 기온은 166.0°C로, 2576-2580년 동안의 평균 기온은 167.3°C로, 2581-2585년 동안의 평균 기온은 168.6°C로, 2586-2590년 동안의 평균 기온은 169.9°C로, 2591-2595년 동안의 평균 기온은 171.2°C로, 2596-2600년 동안의 평균 기온은 172.5°C로, 2601-2605년 동안의 평균 기온은 173.8°C로, 2606-2610년 동안의 평균 기온은 175.1°C로, 2611-2615년 동안의 평균 기온은 176.4°C로, 2616-2620년 동안의 평균 기온은 177.7°C로, 2621-2625년 동안의 평균 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219.3°C로, 2781-2785년 동안의 평균 기온은 220.6°C로, 2786-2790년 동안의 평균 기온은 221

1. 1990년대 초반부터 시작된 '문화유산의 상업화'에 대한 우려  
 2. '문화유산의 상업화'가 '문화유산의 가치'를 훼손할 수 있다는 지적  
 3. '문화유산의 상업화'가 '문화유산의 정체성'을 잃어버릴 수 있다는 우려  
 4. '문화유산의 상업화'가 '문화유산의 가치'를 높일 수 있다는 주장  
 5. '문화유산의 상업화'가 '문화유산의 정체성'을 강화할 수 있다는 주장





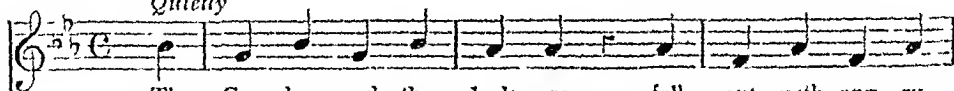


# THE CUCKOO AND THE JACKASS

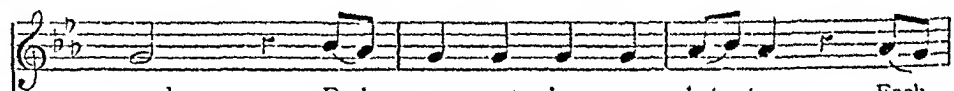
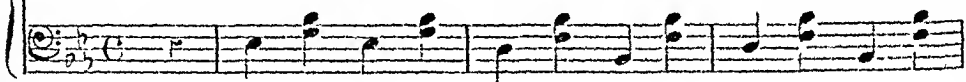
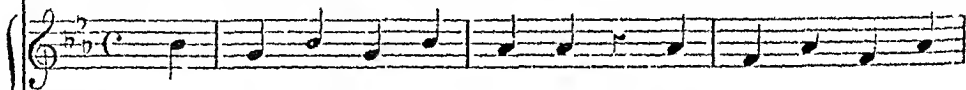
Words by ALFRED COWLEY

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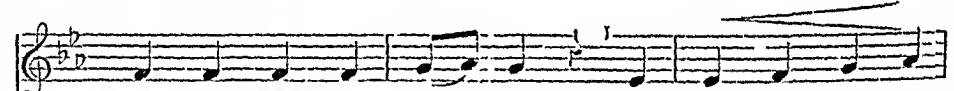
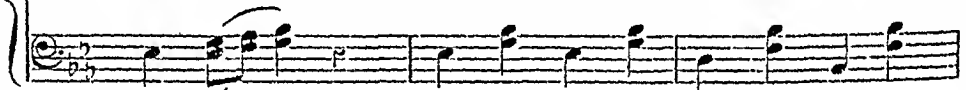
*Quietly*



1 The Cuc - koo and the Jack - ass fell out with ang - ry  
2 The Cuc - koo cried, "I'll prove it," and raised a rous - ing  
3 No strain more sweet was ev - er com - bin'd by bill and



words, Each vow - ing he sang bet - ter, Each  
din, "But I can sing far bet - ter," "But  
jaw In loud re - it - er - a - tion, In



vow - ing he sang bet - ter, Than all the oth - er  
I can sing far bet - ter, The Ass kept chim - ing  
proud re - it - er a - tion, "Cuc - koo! cuc - koo! ee -



birds, Than all the oth - er birds  
in The Ass kept chim - ing in  
aw!" "Cuc - koo! cuc - koo! ee - aw!"



## CHILD AND MOTHER

O Mother My Love if you'll give me your hand

And go where I ask you to wander

I will lend you away to a beautiful land—

The Dreamland that's waiting out yonder

We'll walk in the sweet rose garden & there

Where moon light and starlight are streaming

And the flowers and the birds are filling the air

With the fragrance and music of dreamland

There'll be no little tired-out boys & girls

No questions or cares to perplex you

There'll be no little bruises or bumps to vex you

No pitching of stock & no vex you

For I'll rock you away on a lullaby stream

And sing you to sleep when you're weary

And no one shall know of our beautiful dream

But you and your own little dream

And when I am tired I'll nestle my head

In the bosom of a rose bed meadow

And the wide awake stars shall sing in my stead

A song which our dreaming shall soften

O Mother My Love let me take your dear hand

And away through the starlight we'll wander

Away through the moonlight to beautiful land

The Dreamland that's waiting out yonder





DOCTOR FAUSTUS was a good man,  
He whipped his scholars now and then.

When he whipped them he made them dance,  
Out of Scotland into France,  
Out of France into Spain,  
And then he whipped them back again!



JOHN COOK had a little grey mare; he,  
haw, hum!  
Her back stood up, and her bones they  
were bare, he, haw, hum!

John Cook was riding up Shunter's  
bank, he, haw, hum!  
And there his nag did kick and prank,  
he, haw, hum!

John Cook was riding up Shunter's Hill,  
he, haw, hum!  
His mare fell down, and she made her  
will, he, haw, hum!

The bridle and saddle were laid on the  
shelf, he, haw, hum!  
If you want any more you may sing it  
yourself, he, haw, hum!

I do not like thee, Doctor Fell;  
The reason why I cannot tell  
But this I know, and know full well,  
I do not like thee, Doctor Fell

"WE are three brethren out of Spain,  
Come to court your daughter  
Jane"

"My daughter Jane she is too young;  
She has no skill in a flattering tongue"

"Be she young, or be she old,  
It's for her gold she must be sold,  
So fare you well, my lady gay,  
We'll call again another day"

"Turn back, turn back, thou scornful  
knight,  
And rub thy spurs till they be bright."

"Of my spurs take you no thought,  
For in this land they were not bought.  
So fare you well, my lady gay,  
We'll call again another day"

"Turn back, turn back, thou scornful  
knight,

And take the fairest in your sight"  
"The fairest maid that I can see  
Is pretty Nancy. Come to me!"

IF you are to be a gentleman, as I  
suppose you be,  
You'll neither laugh nor smile for a  
tickling of the knee

BUTTONS, a farthing a pair,  
Come, who will buy them of me?  
They're round and sound and pretty,  
And fit for the girls of the city  
Come, who will buy them of me,  
Buttons, a farthing a pair?

MASTER I have and I am his man  
 Gallop a dea & dun  
 Master I have and I am his man  
 An I'll get a wife as fast as I can  
 With a) eighty gaily gambler day  
 Highly pigledy nigledy megledy  
 Gallop a dea & dun

Rock a by baby thy cradle is green  
 Father's a rebelma: in the & a  
 queen  
 And Pettys a lady and wears a gold  
 rim  
 And Johnny's a drummer and brags  
 for the king

Two hole in Redbreasts built their nest  
 Within a hollow tree  
 The hen sat quietly at home  
 The cock sing merrily  
 And all the little ones said  
 Wee wee wee wee wee wee

One day the sun was warm and bright  
 And shone in the sky  
 Cock Robin said My little ones  
 Its time you learnt to fly  
 At I'll the little ones said  
 I'll try I'll try I'll try

I know a club and I wish it  
 I'll tell you by and by  
 When Mamma says Do this or  
 that  
 She says What for and Why?  
 It'll be a better club by  
 If she will say I'll try

Upright Pauls too a far from  
 As full of love as ever  
 The little boys of London  
 They run with sticks and  
 stones  
 And when they cut their foot  
 Ould they cry I'm hurt

As to the green grave the grass  
 is growing  
 And as the pretty girls are  
 growing  
 We'll then with a stick and  
 stone  
 And when they cut their foot  
 Ould they cry I'm hurt

Cock Robin said My little ones  
 Its time you learnt to fly  
 At I'll the little ones said  
 I'll try I'll try I'll try



There was a little man,  
 And he had a little gun,  
 And his bullets were made of  
 lead lead lead;  
 He shot Johnny King  
 Through the mud & the snow  
 And knocked it right off his  
 best best head.



# DOWN AMONG THE WATER-BABIES



There were two kind fairy sisters who looked after the water-babies. One was Mrs Bedonebyasyoudid, and she was uply and would remain ngly until people behaved properly. The other was Mrs Doasyouwouldbedoneby, and she was ever so pretty. She kissed and cuddled little Tom at first, but once when she came she wouldn't pet him, as he had grown rough and was beginning to get a prickly skin, the reason for which will soon appear.

THE STORIES OF CHARLES KINGSLEY

WE have read Kingsley's best known novel "Westward Ho!" and we are now to read a story of a very different kind also written by him. "The Water Babies" is a fairy story and something more. It is an attempt to teach us a great deal about nature and human life and character in the form of a fanciful story. Fairy tales are not supposed to have morals "and that is where Kingsley's story is different from other fairy tales. But here we are chiefly concerned with the story which is an extremely pretty one. "The Water Babies" was originally written to amuse and instruct one of the author's own children a little boy and it has entertained multitudes of children, old and young, since it was first printed.

## THE WATER-BABIES

## BEING A FAIRY TALE FOR A LAND BABY

Once upon a time there was a clumsy sweep and his name was Tom. He was ten years old and he lived in a great town in the North Country where there were plenty of chimneys to sweep and lots of money to earn for his drunken master. It was in the days when little boys were employed to go up the chimneys and clean them out. Little Tom had never been taught to read or write and he was as ignorant and as dirty as a boy could possibly be. He never even washed himself. Altogether he lived a very miserable and lifeless life in the dirty house of his father the sweep.

One day Mr. Gurney was sent for by Sir John Harrington to examine his fine manor. Harrington there and clean all the old moss there. Mr. Gurney was so delighted at the spot that he expressed a wish to buy it. To a dinner and drinking, two of us called on him and he told us that

They were up very early next morning and Teresa and I went looking down again just to remind myself that we were expected to be an extraordinary lot for the 19th was to host the first of the great conference. It was a big day for the hotel. I didn't see the other three come down any more. I was in the kitchen with a waitress, and a table. The waitress was a young woman, the manager of the hotel was a little bit of a man. The waitress was a little bit of a man. The waitress was a little bit of a man.



a. a fur to offer her  
a lift beside him  
is daisy. She de-  
clined that invitation.

saying she would never war  
with Tom. (Lina goes out)  
repl that she m- (Lina goes  
the end and then a single

As Tom and the Irish woman went along she and her man gave him about himself and seemed very sad when he told her that he knew no prayers to say. She told him that at least for now, by the way and that at lunch time I understood our ten rights it has stolen that I must come days with it the other one still in it. Her to hear of this was so wonderful to go with Tom that a great cure to let her up again upon me. He too will like to battle with clean.

[illegible]

한글서체

"What do you know about Vendale?" shouted Grimes, but he left off beating Tom.

"I know about Vendale and about you, too. I know for instance, what happened in Aldermere Copse by night, two years ago come Martinmas."

**THE LAME IRISHWOMAN WHO MYSTERIOUSLY DISAPPEARED FROM SIGHT**

At this, Grimes, who had been glowing so angry that Tom was afraid he might strike the poor Irishwoman, was so cowed by her words—for she evidently knew something for which he could have been imprisoned—that he got on his donkey again without saying anything more. As they neared the great iron gates at the end of the splendid avenue that led to Harthover Place, the Irishwoman took her leave of Grimes and Tom, by disappearing before their eyes, after she had said

"I have one more word for you both, for you both shall see me again, before all is over. Those that wish to be clean, clean they will be, and those that wish to be foul, foul they will be. Remember!"

After this we may suppose that Mr Grimes was in none too good a temper when he arrived at the mansion, where nearly all the inmates, except a few of the servants, were still asleep. There were a great many chimneys to be swept, and due preparations had been made for this, the carpets of the rooms that needed attention being covered over with brown paper round the fireplaces

Tom was sent up a good many chimneys, and came down again safely. But at last he made a mistake, and, coming down the wrong chimney, found himself in a strange room. He had never seen the like before. He had never been in a room unless it were covered over with dust-cloths and paper, so that he stood

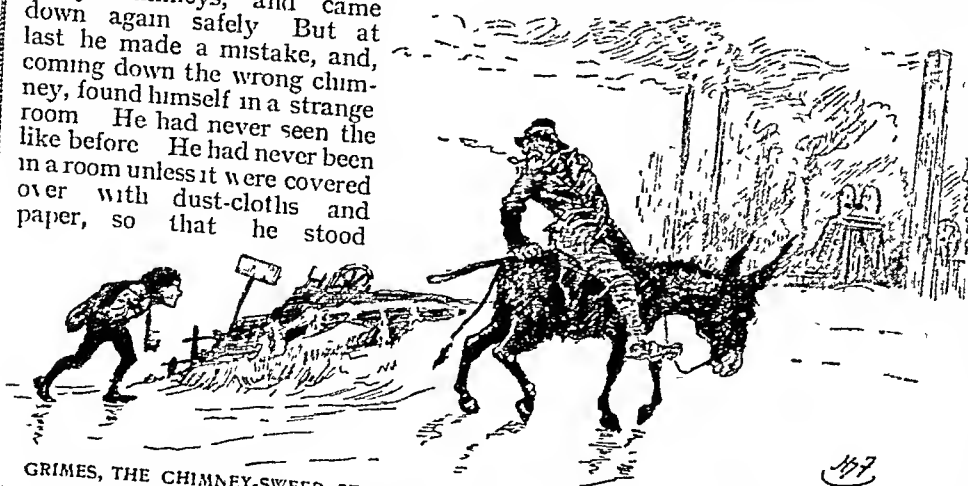
bewildered in this prettiest of bedrooms, where everything was white. There were white window-curtains, white bed-curtains, white furniture, and white walls, and just a few lines of pink here and there. There was a washhand-stand with ewers and basins, and soap and brushes and towels, and a large bath full of clean water. What a heap of things—all for washing!

"She must be a very dirty lady," thought Tom, "to want as much scrubbing as all that. But she must be very cunning to put all the dirt out of the way so well afterwards, for I don't see a speck about the room, not even on the very towels."

Just then he happened to look towards the bed, and there lay the most beautiful little girl Tom had ever seen. He wondered whether all people were as white as she when they were washed. He felt certain that she could never have been very dirty at any time. Thinking of this, he tried to rub some of the soot from his own wrist, and thought, perhaps, he might look better himself some day if he were clean.

**WHAT HAPPENED TO TOM IN THE PRETTY BEDROOM, AND WHY HE FLED**

Suddenly, looking around, he saw standing close to him a little ugly, black, ragged figure, with bleary eyes and grinning, white teeth. His first impulse was to drive this little black ape away from the clean room of the sweet little lady, but when he looked again, and found it was his own reflection in the



GRIMES, THE CHIMNEY-SWEEP, SETS OUT FOR HARTHOVER, WITH TOM TRUDGING BEHIND





handkerchief over it, tied under her chin. At her feet sat the grandfather of all the cats and opposite her, on two benches sat twelve or fourteen neat, rosy, chubby little children, learning their Criss-cross row and gabble enough they made about it to be sure.

**TOM'S PLUNGE INTO THE RIVER, AND HOW HE BECAME A WATER-BABY**

When Tom ventured to step into the cottage, his dirty little figure caused a great commotion among the chubby little children. At first the old woman would have turned him out, but when Tom pleaded that he was faint for lack of food and drink her kind heart was touched, and, giving him some bread and milk, she took him to an outhouse where, on some soft hay, he could rest quite snugly. She promised to come to him an hour later, when school was over, and then left him.

Tom did not fall asleep at once, for he could hear the pleasant noise of the stream that ran close by and, as he lay, half asleep and half awake, the thought that rose uppermost in his mind was "How to be clean."

People would never let him enter any decent place in his dirty state, he could never see inside a church—and he wished very much to see inside one—unless he were cleaned. "I must be cleaned, I must be cleaned," he kept saying aloud, and, half awake, he found himself out of the house and in the meadow, making for the stream, where, pulling off his ragged clothes, he plunged into the cool water.

Just before Tom had taken the cold plunge, the fishwoman had stepped into the stream and cleaned into the most beautiful of fancies underneath the water. For she was indeed the famous old Water-Fairy, who was always waiting to receive her little subjects from the land-world.

**WHY SHOULD THERE NOT BE WATER-FAIRIES AS WELL AS LAND-FAIRIES?**

It is not strange that there are land-fairies, for there are many things in the world that are not of this world, and it is not strange that there are water-fairies, for there are many things in the world that are not of this world.

the little sweep, and was afraid he might have fallen over some of the crags. The old dame at the cottage found he had vanished at the end of the hour, and, for a moment, was inclined to doubt the truth of his story; but when Sir John and the keepers arrived at her house, she knew that Tom had told the truth. They found the little fellow's rags by the side of the stream, and they also discovered his body in the water, and buried it over in Vendale churchyard, where the old dame used to go on Sunday to place flowers on the little grave. They were quite certain that Tom was dead.

But all the time Tom was swimming about in the stream, although he was now only about four inches long, with a set of external gills, just like those of an eel. The fairies had transformed him into a water-baby, and the body that had been found and buried was only the disused shell of him. There are land-babies, and why not water-babies? Some people tell us that water-babies are contrary to nature, but there are so many things in nature which we don't expect to find that there may just as well be water-babies as not.

**TOM'S EARLIEST ADVENTURES AMONG THE CREATURES OF THE WATER-WORLD**

Tom was extremely happy swimming about there in the river. He had even forgotten that he used to be so dirty. But he remembered how much he had been overworked in the land-world and meant to make up for it by living nothing but holidays in the water-world for a long, long time to come.

He was still as mischievous as any land-baby, and made himself a perfect nuisance to the other creatures of the water, teasing them as they went about their work, until they were all afraid of him and got out of his way or crept into their shells, so that he had no one to speak to or to play with.

It was from a desire to find out how he came to be a water-baby that he had started out on his first adventure. For all his dirty sight, the old dame had received a great many letters from him in water, which she had been sending him, and he had been very much interested in them. He had been very much interested in them, and he had been very much interested in them.

otter and drove her off much to Tom's relief though he did not guess that these were really water fairies sent to protect him.

But before the otter had been headed off by the approach of the water fairies she had twitted Tom with him, only an elf and told him he would be eaten by the salmon when they came up from the sea—the great wide sea. Tom himself decided he would go down the stream and discover what the great

sea had done himself but there he lay quite still at the bottom of the pool and never went porching salmon any more.

Every creature in the stream seemed to be hurrying down to the sea and Tom being the only water baby among all the squarming eels and the eels of different than his and little we may guess that he had many strange adventures before he came to the sea. But great was his disappointment to

THE FRIGHTFULLY WISE OLD PROFESSOR AND THE WATER BABY



There is a little fellow, and the sea-bird with a  
sightfully wise and protective who and there  
are something a water-bird, and I think  
he knows me and is a Tom! But the  
Professor said about it was a water baby  
and when Tom was just from the sea he  
to a little boy, but surprised and bowed himself

with sea was but in the way to  
a great way to the sea and  
and in the way to the sea and  
the sea was but in the way to

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sightfully wise and protective who and there  
are something a water-bird, and I think  
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are something a water-bird, and I think  
he knows me and is a Tom! But the  
Professor said about it was a water baby  
and when Tom was just from the sea he  
to a little boy, but surprised and bowed himself

about among the rocks on the seashore, and there one day, a funny thing happened to him. Lady Harthover whose little daughter Tom had frightened the day he came down the wrong chimney, had come down to stay at the seaside with Elie for a holiday. The little girl often went for walks along the shore with a very kind, good-natured, little, old gentleman, named Professor Pthmlinspres, which is a very ancient and noble Pohsh name. He was professor of Necrobioneopalaeonhydrochthomanthropopitheology in the university which the King of the Cannibal Islands had founded, and had come to collect strange specimens from the seashore.

Little Elie believed there were water-babies, but the frightfully wise old professor assured her that such ideas were all nonsense, although, after he had entered into long explanations which explained nothing, all he could say in reply to Elie's question, "Why are there no water-babies?" was "Because there ain't," which was neither very grammatical nor very polite.

#### HOW TOM WAS CAUGHT IN A NET, AND HOW HE ESCAPED AGAIN

Just as he said this, he was groping with his net among the seaweed, and caught Tom in the meshes.

"Dear me!" he cried. "What a large pink Holothurian, with hands, too! It must be connected with the Synapta." And he took him out. "It actually has eyes!" he cried. "Why, it must be a Cephalopod! This is most extraordinary!"

"No, I ain't!" cried Tom, as loud as he could, for he did not like to be called bad names.

"It is a water-baby!" cried Elie; and of course it was.

"Water-fiddlesticks, my dear!" said the professor, and he turned away sharply. But there was no denying it. It was a water-baby, and he had said, a moment ago that there were none. What was he to do?

It was, in a way, fortunate for the professor that, when he poked Tom with his finger the water-baby bit him so smartly that he was glad to drop him on to the seaweed, whence Tom dived into the water, and was gone in a moment. Little Elie, in her desire to have the pretty little water-baby, tried to catch Tom before he disappeared

into the sea, but, slipping on the rocks, she hurt herself so badly that she had to be carried away and taken home, where one night the faeries came along the moonbeams, bringing with them a pair of wings, with which beautiful little Elie flew away in their company.

#### TOM HAS AN EXCITING TIME WITH HIS FRIEND THE LOBSTER

Now, when Tom had been picked up by the professor, he had recognised little Elie, and wished so much that she could have been his playmate. But soon, as he was going along at the bottom of the sea, he came across a poor old lobster, with whom he had been friendly, caught in a lobster-pot. He tried to help him out, in doing which he nearly came to grief from the otter, who came along and accused him of having warned the salmon against her.

As it was, however, the otter got the worst of it in the fight that took place between the lobster and herself in the lobster-pot, and Tom was afraid his friend the lobster was going to be caught, when he saw the pot being pulled up. He escaped from it himself in time, and was delighted to see the lobster manage to snap away from it at the last moment, even at the cost of leaving one of his claws behind him, which, of course, was only a temporary inconvenience, as it would grow again.

And now a most wonderful thing happened to Tom, for he had not left the lobster five minutes before he came upon a water-baby. A real live water-baby, sitting on the white sand, very busy about a little point of rock. And when it saw Tom it looked up for a moment, and then exclaimed with delight "Why, you are not one of us! You are a new baby! Oh, how delightful!"

#### TOM GETS TO KNOW OTHER WATER-BABIES AT LAST

And it ran to Tom, and Tom ran to it, and they hugged and kissed each other for ever so long, they did not know why. But they did not want any introductions there under the water.

At last Tom said, "Oh, where have you been all this while? I have been looking for you so long, and I have been so lonely."

"We have been here for days and days. There are hundreds of us about the rocks. How was it that you did not see us or hear us when we sang and

romped about the rocks and sand every evening before we went home.

Tim looked at the baby again and then he said:

Well this is wonderful. I have seen things just like you again and again but I thought you were shell or sea creatures. I never took you for water babies like myself.

Now was not this very wild? So odd indeed that you will no doubt want to know how it happened and why Tom could never find a water baby till after he had got the lobster out of the pot. But if you will read this story nine times over and then think for yours if you will find out why. It is not good for little boys to be told every thing and never to be forced to make use of their own wits.

Sun  
and the baby  
cries and  
help me or I  
shall not live  
find help before  
my brother  
and every  
evening and it  
is a new time  
to go home

What shall I tell you, my friend?

not dear  
little red

... the ...  
... the ...  
... the ...  
... the ...  
... the ...  
... the ...

1. 凡在本市范围内从事生产、经营活动的法人和其他组织，均应当依法向税务机关申报纳税。  
 2. 纳税人应当按照规定的期限，向税务机关报送纳税申报表，并缴纳税款。  
 3. 纳税人未按规定期限申报纳税的，税务机关有权依法加收滞纳金，并处以罚款。  
 4. 纳税人有逃避纳税义务行为的，税务机关有权依法采取税收保全措施和强制执行措施。  
 5. 纳税人对税务机关作出的具体行政行为不服的，可以依法申请行政复议或者提起行政诉讼。  
 6. 税务机关应当依法加强税务管理，提高征管效率，为纳税人提供优质服务。  
 7. 纳税人应当自觉履行纳税义务，维护国家税收秩序，促进经济社会健康发展。  
 8. 违反本法规定的行为，将依法追究法律责任。

the water ladies all along and he did not know them because his eyes and ears were not used.

And in they came dozens and dozens of them some bigger than I am and some small as all in the greatest little white lathing dresses and when they found that he was a new boy they hugged him and kissed him and then put him in the middle and danced round him on the sand. And there was no one ever so happy as poor little Tomy.

He gaily swam away with them to their home in the caves beneath St. Praxian, fairly, but he was still a naughty little water baby, even to annoying himself by tormenting the

along the  
crabs and  
other old  
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the sea and  
paving the  
to the sea  
of the water.

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about among the rocks on the seashore, and there, one day, a funny thing happened to him. Lady Hartlover, whose little daughter Tom had frightened the day he came down the wrong chimney, had come down to stay at the seaside with Ellie for a holiday. The little girl often went for walks along the shore with a very kind, good-natured, little, old gentleman, named Professor Ptthmln-sprcs, which is a very ancient and noble Polish name. He was professor of Necrobioneopalaeonthydioclitthomanthropopitheology in the university which the King of the Cannibal Islands had founded, and had come to collect strange specimens from the seashore.

Little Ellie believed there were water-babies, but the frightfully wise old professor assured her that such ideas were all nonsense, although, after he had entered into long explanations which explained nothing, all he could say in reply to Ellie's question, "Why are there no water-babies?" was "Because there ain't," which was neither very grammatical nor very polite.

#### HOW TOM WAS CAUGHT IN A NET, AND HOW HE ESCAPED AGAIN

Just as he said this, he was groping with his net among the seaweed, and caught Tom in the meshes.

"Dear me!" he cried. "What a large pink Holothurian, with hands, too! It must be connected with the Synapta." And he took him out. "It actually has eyes!" he cried. "Why, it must be a Cephalopod! This is most extraordinary!"

"No, I ain't!" cried Tom, as loud as he could, for he did not like to be called bad names.

"It is a water-baby!" cried Ellie, and of course it was.

"Water-fiddlesticks, my dear!" said the professor, and he turned away sharply. But there was no denying it. It was a water-baby, and he had said, a moment ago, that there were none. What was he to do?

It was, in a way, fortunate for the professor that, when he poked Tom with his finger, the water-baby bit him so smartly that he was glad to drop him on to the seaweed, whence Tom dived into the water and was gone in a moment. Little Ellie, in her desire to have the pretty little water-baby, tried to catch Tom before he disappeared

into the sea, but, slipping on the rocks, she hurt herself so badly that she had to be carried away and taken home, where one night the fairies came along the moonbeams, bringing with them a pair of wings, with which beautiful little Ellie flew away in their company.

#### TOM HAS AN EXCITING TIME WITH HIS FRIEND THE LOBSTER

Now, when Tom had been picked up by the professor, he had recognised little Ellie, and wished so much that she could have been his playmate. But soon, as he was going along at the bottom of the sea, he came across a poor old lobster, with whom he had been friendly, caught in a lobster-pot. He tried to help him out, in doing which he nearly came to grief from the otter, who came along and accused him of having warned the salmon against her.

As it was, however, the otter got the worst of it in the fight that took place between the lobster and herself in the lobster-pot, and Tom was afraid his friend the lobster was going to be caught, when he saw the pot being pulled up. He escaped from it himself in time, and was delighted to see the lobster manage to snap away from it at the last moment, even at the cost of leaving one of his claws behind him, which, of course, was only a temporary inconvenience, as it would grow again.

And now a most wonderful thing happened to Tom, for he had not left the lobster five minutes before he came upon a water-baby. A real live water-baby, sitting on the white sand, very busy about a little point of rock. And when it saw Tom it looked up for a moment, and then exclaimed with delight "Why, you are not one of us! You are a new baby! Oh, how delightful!"

#### TOM GETS TO KNOW OTHER WATER-BABIES AT LAST

And it ran to Tom, and Tom ran to it, and they hugged and kissed each other for ever so long, they did not know why. But they did not want any introductions there under the water.

At last Tom said "Oh, where have you been all this while? I have been looking for you so long, and I have been so lonely."

"We have been here for days and days. There are hundreds of us about the rocks. How was it that you did not see us or hear us when we sang and

tumped about the rocks and sank every evening, before we went home.

Tom looked at the baby again and then he said

Well this is wonderful! I have seen things just like you again and again but I thought you were shells or sea-creatures. I never took you for water babies like myself!

Now was not this very odd? So odd indeed that you will not doubt want to know how it happened and why Tom could never find a water baby till after he had got the lobster out of the pot. But if you will read this story nine times over and then think for yours if you will find out why.

It is not good for little boys to be told every thing, and never to be forced to make use of their own wits.

Now said the baby come and help me. I shall not have finished before my brothers and sisters come and it is time to go home.

Well said I will help you.

At first I said I would not but I have changed my mind.

Tom went to the door but he was too late. The water baby had been caught by the lobster and was now in the pot. Tom was very angry and he said to himself I shall never find a water baby again.

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the water babies all along only he did not know them because his eyes and ears were not opened.

And in they came dozens and dozens of them some bigger than Tom and some smaller all in the neatest little white bathing dresses and when he found that he was a new baby they hugged him and kissed him and then put him in the middle and danced round him on the sand. And there was no one ever so happy as poor little Tom.

He easily swam away with them to their home in the caves beneath St. Francis Bay. But he was still a naughty little water baby given to amusing himself by tormenting the

anemones the crabs and other odd creatures of the sea and paying no heed to the voice of the water ladies who said Take care what you are at. Mrs. Brown has all her things in the water.

Early one day when the water babies were playing on the sand Tom was very angry and he said to himself I shall never find a water baby again.



Tom went to the door but he was too late. The water baby had been caught by the lobster and was now in the pot.

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and making them think for a moment that they had caught a good dinner "As you did to them, so I must do to you," said Mrs Bedonebyasyoudid.

She also told him that it was quite useless for him to try to lude his actions from her, as she knew everything that the water-babies did, and could not help punishing those who did wrong.

**WHAT TOM WAS TOLD BY MRS BEDONEBYASYOUIDID**

She told him, too, that she was the ugliest fairy in the world, and would have to remain so until people behaved themselves properly when she would grow as beautiful as her sister, Mrs Doasyouwouldbedoneby.

"Now all of you run away, except Tom," she said; "and he may stay and see what I am going to do. It will be a very good warning for him to begin with before he goes to school."

Then she called up all the doctors who had given little children too much physic, and she made them take their own medicines, such as salts and senna, and brimstone and treacle, to say nothing of pulling out their teeth. Then she called up all the careless nursemaids, and stuck pins into them all over, and wheeled them about in perambulators, with tight straps across their stomachs and their heads and arms hanging over the sides. After luncheon she punished all the cruel schoolmasters and altogether she had a very exciting and exhausting day. All this had to be done every Friday, so we can see that her job was by no means an easy one. But people cannot always choose their own professions.

It was on Sunday that the ugly fairy's beautiful sister visited the water-babies, who were all delighted to see her.

**HOW TOM WAS STRANGILLY PUNISHED BY HIS OWN CONSCIENCE**

To Tom in particular she was very kind, and petted him a great deal, but this did not make him a better water-baby for he had now grown so fond of the sweet things. Mrs Bedonebyasyoudid kept in a secret store that he searched out her liding-place and ate as many as he could.

Of course, the fairy knew what he had done, but she was more sorry than angry with the little fellow, and said nothing about it next time, giving him his share with the rest. She left it to

his conscience to punish him, and that did its work in a very curious way. When Sunday had come round again, and Mrs Doasyouwouldbedoneby had come back, Tom was very anxious to be petted and cuddled by the beautiful fairy, but she said she could not do so, for, since her last visit, he had grown horny and prickly all over his body. And it was as she said. Just as his conscience had been pricking him on account of his wrong-doing, his body, too, had become as prickly as some of the sea-shells.

Tom could now see that the best thing to do was to confess to Mrs Bedonebyasyoudid next Friday, and leave her to deal with him. This she did very gently, forgiving him for his naughtiness, and promising to send him a schoolmistress who would teach him how to get rid of his prickles. Who should this schoolmistress prove to be but little Elhe, who was now one of the most beautiful of the water-babies, and she came to know by-and-by that her little pupil had been the chimney-sweep who frightened her ever so long ago.

**TOM'S WONDERFUL JOURNEY TO THE OTHER-END-OF-NOWHERE**

For seven whole years they studied together, but as Elhe always went away on Sundays and Tom wondered where she was, he grew discontented, and said she was tired of him. He had more reason to be discontented when she disappeared altogether, and Mrs Bedonebyasyoudid told him it was she who had sent Elhe away. She also showed him "The History of the Doasyoulikes," people who had come away from the country of Hardwork, and what happened to them was certainly enough to frighten poor Tom.

In his new desire to win the good opinion of Mrs Bedonebyasyoudid, he said he was ready to go to the world's end to find his old master, Mr Grimes, who, the fairy said, was now at the Other-end-of-Nowhere. In order to get there he had first to go to Shiny Wall, and then through the White Gate that was never opened, on the way to Peace-pool and Mother Carey's Haven, where the good whales go when they die. If he ever got there Mother Carey was to tell him how he could reach the Other-end-of-Nowhere, and find Mr. Grimes. The journey was a very, very long

one indeed. All the way Tom fell in with adventures, but there was always somebody to help him with advice. There was the king of the Herrings for instance, who showed him the way to the Allalonestone, where he was to find the last of the Curfowl. In due course he came up to this queer old creature, who was rather like a penguin sitting on her stone very mournfully. So said Tom her sad story, at the end of which she wept tears of pure oil, and confessed that her poor old brains were getting quite puzzled. She really did not know the way to Mother Carey's Haven at all. But a flock of petrels came winging along, and when they heard what Tom was wanting, they said:

"Shiny Wall? Do you want Shiny Wall? Then come with us. We are Mother Carey's own chickens and she sends us out over all the seas to show the good birds the way home."

Thanks to them, Tim soon reached Sunny Wall which was really a big iceberg under which he had to dive and swim for seven days and seven nights in order to come to Liverpool.

**TIM STAYS** MOTHER CAREY AND AT 190 FINDS HIS MOTHER ED A CHIMNEY

There at last in the midst of the  
foul sat Mother Carey like a granite  
marble statue on a throne. And from  
the feet of the throne there came  
away out and out into the sea millions  
of new born creatures of more strength  
and endurance than man ever knew,  
and they were Mother Carey's children  
who on the surface of the sea water  
all day long.

[illegible]

lun Mrs. Perkins would now appeared on the scene and tended Grimes that he had often treated Tom as he is now being treated him self. Tom however urged her to let him help his old mother and vainly tried to wipe the soot from Grimes' face.

HOW TOM GOT HIS OLD MASTER RELEASED FROM THE CHIMNEY

Toni was so sincerely anxious to help him that his efforts at his softened heart had the effect of the matter very who not begin to think of the mother before the accident and she kept over in own weak days. It seems that he had intended at which state that they were of the same from his face and clothes and then they had it all morning away from him in the back and the chimney are added down and Grimes began to get out of it.

Will you obey me if I give you a chance?" said Mrs. DeWitt very much

Is your peace my aim? I & I  
best and that's the truth! say I!

But I can't—no, no corpse at  
But I can't—no, no corpse at  
But I can't—no, no corpse at

I like your picture, and am glad to  
re-enclosedly, as it is known. I  
travel a little, but I get home, as I  
you till I came to these ugly quarries.

Never can it be. Why not? It is  
that will be found good they will be so.

General and his 110th steps  
 was for the reason that the line  
 was in the middle of the line  
 out there to have yet. She did  
 (Carmichael) "The other side of  
 a for ever was to see that he  
 told him to the other side  
 of the line. The other side

THEY WILL BE AT BRANSON AIR  
AND MEET WITH AGENTS

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the whole of the world is now  
the whole of the world is now

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# THE LIGHT OF THE WORLD



This wonderful printing, by Mr Holman Hunt, has travelled all over the British Empire, and has preached its message to many thousands of people. By placing no latch on the outside of the door, the artist means to teach us that the light will not force an entrance into the soul, but must be admitted from the inside.



We read on another page some of the chief stories and some of the most striking incidents recorded in the Gospels of the New Testament. We must remember when we read of something that is hard to understand, that none of these things hard to understand alter in any way the chief thing of all, and by far the most important thing of all—the fact that Jesus lived and preached God's Fatherhood and Man's Brotherhood.

THE CHARACTER OF JESUS DOES NOT  
DEPEND UPON EVENTS

It is most important that we should not bow entirely independent of events to the love and beauty of the character of Jesus. It is the character of Jesus that has conquered the world, not documents.

Yet we should understand clearly the honesty of our earliest written records concerning Jesus. We should feel that Mark in writing the story which we read was writing something intensely real to him. This can be proved.

Mark it is thought, wrote from the instruction of St. Peter, chief of the Apostles, whose Epistles written in Greek, a language he would know nothing about, was also probably the script of Mark. He is known to have been the companion of St. Paul, with whom he had some difference of opinion, and he was a cousin of St. Barnabas. Of all the writers of Christian life it is to St. Mark that we turn, if not for illumination and spiritual light, at any rate for guidance where the other writers disagree. His Gospel, at all events, is the touch-stone, the touchstone, and measuring narrative of a plain man, in such a narrative as we might expect from the fisherman called by Christ to be a labourer in the world.

THE HONEST WRITINGS OF THE APOSTLES  
WHICH PROVE THEIR TRUTH

Now, in St. Mark and also in the  
other Gospels there are certain state-  
ments which are not in the  
other Gospels. These statements have been  
used by the writers of the other Gospels  
in the same way as the writers of the  
other Gospels have used the statements  
of St. Mark. This is the case with  
the statements of St. Mark which are  
not in the other Gospels. This is the  
case with the statements of St. Mark  
which are not in the other Gospels.

$\frac{d}{dt} \left( \frac{1}{r^2} \right) = -\frac{2}{r^3} \frac{dr}{dt}$

accuracy. But if he found in this book certain admissions, certain honest statements showing that the hero sometimes failed in his attempts, then he would feel that the hero did at least really exist, and that he exerted so great an influence upon those about him that they wrote down everything they could remember, even things which seemed to tell against him.

Such statements we find in Gospel stories concerning Jesus

St. Mark tells us that on one occasion His friends "went out to lay hold on Him: for they said, He is beside Himself." Now, we may be quite sure that Mark would never have hinted at such a thing unless it was true.

St. Mark writes that Jesus said of the end of the world: "Of that day and hour knoweth no man; no not the angels which are in heaven; neither the Son, but the Father." Would he have written such a sentence if he were seeking to persuade people that Christ was equal with God? We cannot think that Mark would have done so.

THE FOUNDATION PILLARS OF THE HISTORY OF JESUS

St Mark also makes Jesus say: "Why callest thou Me good? There is none good but One, that is, God."

And again, the cry on the Cross:  
"My God! My God! Why hast Thou  
forsaken Me?"

Of His works of healing, we are told that when Jesus came to Nazareth, "He could there do no mighty work, save that He laid His hands upon a few sick folk, and healed them. And He marvelled because of their unbelief."

There are more of these foundation pillars, but to examine them would carry us too far. Let this we have quoted convince us that the records of the New Testament are the work of honest men. They set down things which appeared to tell against the claim, the writers were making to establish. The influence of Jesus is so great that even a few like him would develop that they were doing all they could powerfully, and all that they had to say had occurred to them, and the truth from the fact that they were really making the most of the evidence of the testimony, and to have them declared, even by us the more would it be for the good.

$\frac{1}{2} \pi - \alpha = \gamma$

# The Child's Story of THE EARTH

A small piece  
of iron will  
be found to  
weigh about  
7 1/2 lbs.



When a piece of iron is placed in a glass of water, it displaces an equal volume of water. If the displaced water and the iron be weighed, it will be found that the iron is about 7 1/2 times as heavy as the water and so it weighs 7 1/2 times as much.

## THE SIZE AND WEIGHT OF THINGS

We read about the way in which things are measured—about the measurement of time, temperature, mass, and so forth (in page 30). We can also learn to distinguish between weight and mass, and we may learn something about the balance of forces. We must now learn a little more about gravity, and then about another very interesting thing which is called specific gravity.

In the case of gravitation we can allow things to drop, and measure their rate of fall, as we read on page 17. It is very difficult, however, to get accurate results by this method. Far more precise results can be obtained by the use of a pendulum, or the rate at which a free pendulum swings depends upon gravity, and when we use the method we find that the rate of the same pendulum is slower at the foot of a hill than at the top of the hill.

It is an old story that the first great test of the earth's weight was made by the earth's weight at the North Pole. It was found that the earth's weight at the North Pole was about 1/2 the weight at the South Pole.

At the North Pole the weight of the earth is about 1/2 the weight at the South Pole.



When at the North Pole the weight of the Earth is about 1/2 the weight at the South Pole. But there is a very large difference in the weight of the Earth at the North Pole and at the South Pole. The Earth is heavier at the North Pole than at the South Pole.

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it is bound to move. This force acts against the earth's gravitation, indeed, it is the earth's gravitation that prevents things from flying out, and keeps them travelling in a circular path on the earth's surface, though the motion in them—like that of a stone in a sling—wants to make them fly out.

**THE PULL OF THE EARTH, THAT GETS LESS AS WE APPROACH THE EQUATOR**

Therefore, as the force acting against the earth's gravity increases as we approach the Equator, the force of gravity, when we weigh it, seems to be less the nearer we go to the Equator. It actually is less, because we are farther from the centre of the earth.

We know that gravity has the power of increasing by 32 feet in every second the rate at which anything falls to the earth. It is this rate by which we measure gravity, and now we can say more exactly what the figures are, and we can also learn the proper way in which to state them. We can take, for example, the first letter of the word gravitation, and we can let the letter *g* stand for the intensity of gravity in any part of the world. In England the value of *g*, we say, is about 32.2 feet per second, that is to say that for every second that anything falls in the British Isles its rate of falling is increased by about 32.2 feet each second, in other words, gravity produces, in England, during every second of its action, an acceleration—that is, a quickening—of 32.2 feet each second.

Now, the value of *g* at the Poles is about 32.25. We know that 25 is a quarter, so that for every second during which a body falls at the Poles, gravity increases its speed by about 32 feet 3 inches, whereas in England the 3 inches would be nearer 2 inches. The value of *g* at the Equator is decidedly less than 32.1, so that the acceleration will be very little more than 32 feet 1 inch every second.

**THE MEANING OF SPECIFIC GRAVITY, AND WHY IT IS IMPORTANT**

We must now go on to study something else which depends upon gravity, and which is called *specific gravity*. The word *specific*, which is very much used in all the sciences, is really another word for *special*. It means, to end with the wonders, know we have achieved of this hero, "special" be it to doubt its

of a thing, or of its specific heat, or the specific characters of a particular kind of animal or plant, and in all these cases the word practically means *special*.

When we talk of the *specific gravity* of anything, we are simply using a short expression for the amount of stuff in it in proportion to the space it occupies. A pound of lead takes up a great deal less room than a pound of wood; the lead has more stuff or matter in a given space. If we remember the word *mass*, we may say that the lead is more massive.

This question is very important, because of the great results which follow from the differences in the *specific gravities* of things. One thing floats and another sinks. When we run hot water into a bath of cold water, the hot water floats on the top of the cold, if we run cold water in after hot water, it runs as a stream at the bottom of the hot water; the warm breath from our lungs rises in the cooler air into which it is breathed, a balloon filled with hot air or hydrogen will float, or rise, and so on. All of these facts, and thousands more, depend upon the important question of *specific gravity*.

**WHY WE USE WATER AS A STANDARD FOR MEASURING WEIGHTS OF THINGS**

We are now faced again with the question of measurement. We want to be able, in some short and simple way, to say how heavy gold is compared with water, or how heavy water is compared with alcohol, and so on. That is the way we put it in ordinary speech. We say that one thing is heavier than another, we do not mean that a pound of gold is heavier than a pound of water, but that we can get a greater weight of gold than we can of water into a given space. Gold has a greater *specific gravity*. Water is such a common substance, and so important, that we may take it as our standard.

Ordinary water contains various things dissolved in it, especially gases, and these make a difference. So when we speak of water in this connection, we mean distilled water, but this is not all. We know that, as a rule, when things are heated they expand, and when they are cooled they shrink. The amount of stuff in a given space changes, in other words, the *specific gravity* changes. So it will not do to say distilled water. We must know at what temperature we

are considering it. When we study water we find that it is densest most shrunken or heaviest when it is 4 degrees centigrade above its freezing point.

On the second centigrade scale the freezing point of water is nothing so that 4 degrees centigrade indicates the temperature at which water is densest. Now we can take this as our standard. The specific gravity of pure distilled water is 4 degrees centigrade which we shall for convenience call 1 then if we find anything that has twice this specific gravity we shall call that 2 and so on.

We must choose all sorts of different things and compare the weight of a given volume of each with the weight of an equal volume of water at 4 degrees centigrade. Here we are measuring weight of course and we are using it as an indication of the mass in the things we are examining. We are perfectly entitled to do this because Newton has taught us that the weight of everything depends upon gravity and that the force of gravity is found precisely upon mass. So if we compare the weight of things we are really computing their masses.

Now we may find out the specific gravity of anything solid.

Now suppose that we want to find out what the specific gravity of some solid is like this. We weigh it all right but we want to know more than what it weighs. We cannot tell its specific gravity until we know how much space it occupies and if it is an irregular thing this may be a little awkward to find out. If it is a thing shaped like a cylinder or a sphere or a cube or a cylinder that is a different shape we can easily find its volume by measuring its length and diameter or its radius and so on. If it is a piece of water and is pure distilled water then

it is just as easy to find out its volume as it is to find out its weight. We take a graduated cylinder and we fill it with the water and we weigh it. We know the weight of the water and we know the volume of the water and we divide the weight by the volume and we get the specific gravity of the water. This is the same as saying that the specific gravity of water is 1.000. If we have a piece of wood and we want to find out its specific gravity we weigh it and we find out its volume by measuring its length and diameter and so on. We divide the weight by the volume and we get the specific gravity of the wood. This is the same as saying that the specific gravity of wood is less than 1.000.

comes up to the standard and we can do this by measuring the specific gravity of the milk. In the case of liquids we want to know how much alcohol is contained and we can do this by determining their specific gravity. These are two common instances but there are very many others could be mentioned.

A LITTLE INSTRUMENT THAT TELLS THE SPECIFIC GRAVITY OF ANY LIQUID

There is a single little instrument called the hydrometer which measures water raised by which anyone can find out in a moment the specific gravity of a liquid. It is simply a glass tube with a weight at the lower end and with a scale marked on it like that on a thermometer.

The heavier the fluid in which we place the hydrometer the less is the depth to which it will sink before it floats. On the tube is a mark which shows the level at which the hydrometer will float in water. If the liquid is lighter than water it will sink deeper than the water mark and if it is heavier than water it will sink less deep. We shall see in a moment what it is used for. It is used to find out the specific gravity of liquids and it is obtained with this simple little instrument.

Another kind of instrument for measuring specific gravity is called a specific gravity bottle and it is very simple to use. We fill it with the liquid we want to measure and we weigh it. We know the weight of the bottle and we know the weight of the liquid and we divide the weight of the liquid by the weight of the bottle and we get the specific gravity of the liquid. This is the same as saying that the specific gravity of the liquid is the weight of the liquid divided by the weight of the bottle. The same principle is used in the hydrometer.

A BOTTLE OF WATER AND WHAT IT CAN TELL US

Now we have a bottle of water and we want to find out its specific gravity. We weigh the bottle and we find out its volume by measuring its length and diameter and so on. We divide the weight by the volume and we get the specific gravity of the water. This is the same as saying that the specific gravity of water is 1.000. If we have a piece of wood and we want to find out its specific gravity we weigh it and we find out its volume by measuring its length and diameter and so on. We divide the weight by the volume and we get the specific gravity of the wood. This is the same as saying that the specific gravity of wood is less than 1.000.

as the water of the same volume, then the specific gravity of the shot would be eleven. This would be just about the figure if the shot were made of lead.

Or, again, we could fill such a bottle as this with ether, and then weigh the amount of ether that we could get into it. We should find the bottle that held a thousand grains of water would only hold about 715 grains of ether, so that the specific gravity of ether is 715, if we call the specific gravity of water 1. It is often very convenient to use 1,000 for the specific gravity of water instead of 1, and then we can say that the specific gravity of ether is 715, that the specific gravity of milk is about 1.030—it should not be less—and that the specific gravity of healthy blood is 1.055, and so on.

#### DIFFERENT THINGS COMPARED AS TO THEIR BULK AND WEIGHT

Here is a table which shows us the specific gravities of some important substances as compared with the specific gravity of water, counted as 1. We shall readily understand that those things which possess a specific gravity higher than 1 will sink in water; while those, such as ice, for instance, which have a specific gravity less than 1 will float upon water; but the nearer the specific gravity is to that of water, the greater is the amount of the thing which must be immersed in water before it can float. Here is the list.

SOLIDS			
Platinum (rolled)	22.1	Diamonds	3.5
Gold	19.3	Marble	2.5
Lead	11.4	Aluminium	2.7
Silver	10.5	Ice	0.9
Iron (wrought)	7.5	Potassium	0.9
(cast)	7.2	Lithium	0.6
Tin	7.3	Cork	0.2
LIQUIDS			
Mercury	13.6	Sea-water	1.03
Sulphuric acid	1.84	Petroleum	0.84
Alcohol	1.00	Alcohol	0.79
Milk	1.03	Ether	0.71

Gases, of course, have their own specific gravity, just as solid and liquid. In this case we usually take the gas hydrogen, which is the lightest of all, and we state the specific gravity of other gases by comparison with it. Sometimes at a certain temperature is taken, but it is better to take hydrogen. If, now, we call the specific gravity of hydrogen 1, then that of oxygen is 16, and that of the mixture of the two we call the air is about 14.4; so that air is 14.4 times heavier than hydrogen.

one-fourteenth part as heavy as air, though, of course, if we want to make this statement a precise one, it is necessary to state the exact composition of the air we are comparing it with.

#### WHY A BALLOON GOES UP, BUT WILL NOT GO UP FOR EVER

We can now understand why a balloon filled with hydrogen will rise in the air; we can also understand that there will be a point beyond which it cannot rise, because the air becomes less dense as we pass upwards in it. In other words, the specific gravity of the air is lowered, and there comes a point when it can no longer do more than just sustain the balloon, even though it is filled with hydrogen.

This is all we need say here about the specific gravity of gases but we must note a few of the facts which are suggested in the table of solids and liquids. We notice the great weight of various metals, and also that one of them, though liquid, ranks high in specific gravity, even when compared with solids. This liquid metal is mercury. There is no other liquid which at all approaches it in specific gravity.

All the metals are by no means very heavy. Potassium and lithium, for instance—metals we seldom see in their pure state outside a laboratory—have a specific gravity of less than 1, which means that they will float upon water. Just above them in the table, we notice ice, and remind ourselves that water, when it is cooled to freezing-point from 4 degrees centigrade, expands, and therefore its specific gravity becomes less.

#### THE GREAT VALUE OF ALUMINIUM, THAT IS BOTH STRONG AND LIGHT

Perhaps, after the case of ice, the most important of the specific gravities noticed here is aluminium. This is also a metal, but very much lighter than any of the metals in ordinary use. We have only to compare it with iron, and to remember that aluminium is a strong thing, to see that its extreme lightness must be of great practical importance.

There are some interesting points in the list of liquids. We have already referred to the case of mercury, and we note the astonishing difference between this liquid metal—the only metal liquid at ordinary temperature—and all

the other liquids. Several of the specific gravities noticed in this list are of great importance in testing the purity and the composition of various things. In the official book that gives instructions to chemists, I remember that it is told that such things as oil or sulphuric acid employed by them must have such and such a specific gravity. The simple method of using a hydrometer provides us with an easier and quicker test of purity than any other.

When we compare milk with blood we notice that milk, which I make by the body from blood is slightly more watery. It is one of the most important duties of the body to keep the specific gravity of the blood at a constant level. None of the processes with which the blood is concerned can proceed properly unless its specific gravity is constant. If a person goes without water, fluid has to be drawn into the blood vessels from the tissues around it, in order that the blood shall not become too dense. If on the other hand a person takes a great deal of water, this is not all and I make blood more watery than it ought to be, and all the processes with which it is concerned are immediately brought into disorder. It is a few hours that in a moment the system is deranged, the organs are suffering.

It is the same with the water in the body. If the water is too much, the organs are suffering. If the water is too little, the organs are suffering. The water in the body is a very delicate balance, and it is the duty of the body to keep it at a constant level. If it is not, the body is in danger.

It is for detecting such things that the hydrometer and the principle of specific gravity are so useful.

Of course a very interesting question arises whether we can use the principle of water, in milk, when we put the water into the can, instead of putting it into the milk. It is the business of the law to say that you shall not sell a milk anything which has less than a certain specific gravity. Now if its density is too low, its specific gravity must not be made too high. If we put it in the can, the natural viscosity will be there. If we put it in the can, the natural viscosity will be there. If we put it in the can, the natural viscosity will be there.



The hydrometer and how it is used. It is a glass tube with a bulb at the bottom and a scale on the side. It is used for measuring the specific gravity of liquids. The bulb is filled with a liquid of known specific gravity, and the tube is inverted in the liquid to be measured. The level of the liquid in the tube is then read on the scale.

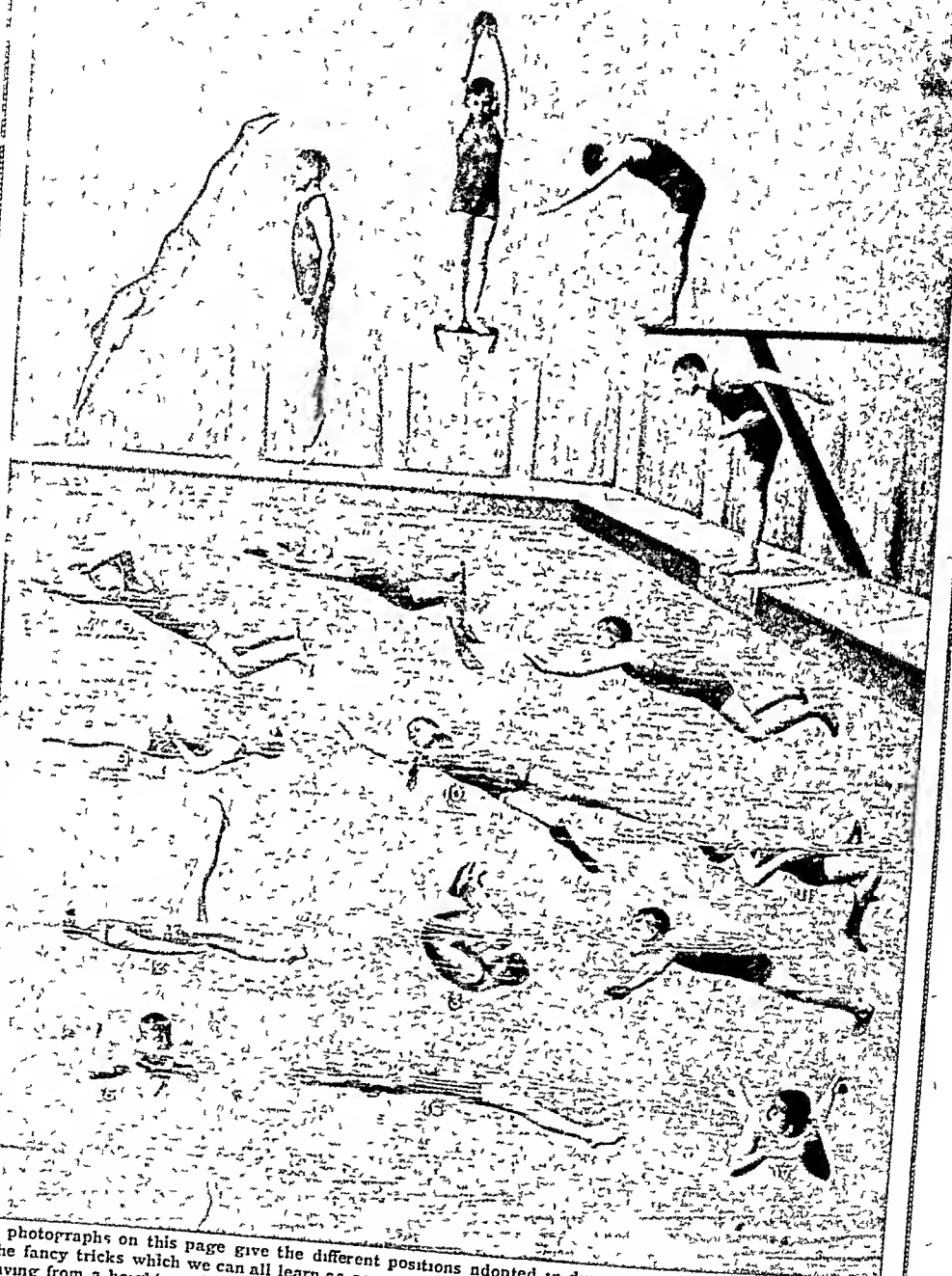
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# THE ART OF SWIMMING AND DIVING



The photographs on this page give the different positions adopted in diving and swimming, and also some of the fancy tricks which we can all learn as soon as we can swim easily. How graceful it is possible to look in diving from a height is shown in 1, where the body is in almost a straight line. Diving feet first from a height is shown in 2. Here the diver will go deeper than in diving head first. A Swedish dive is being taken in 3, and a high dive in 4, while the way to dive in at the start of a race is shown in 5. No time must be lost in coming to the surface in this dive. Three of the positions the swimmer assumes in the breast-stroke are shown in 6, the side-stroke in 7, 8, and 14. Swimming on the back is shown in 9, the trudgen, or Indian, stroke in 10, the torpedo float, in 11, the dead man's float, in 12, the nantlin, in 13, turning a somersault, and in 15, swimming like a crab

THINGS TO MAKE  
AND  
THINGS TO DO



HOW TO SWIM AND DIVE

come readily to the surface if we keep our head well back with our ears under the water, and, if we lie quietly, we shall find that we do not sink. To move along, however, we bring our hands to our sides. Both arms are then brought out of the water in a circular sweep, and placed in the water as far behind our head as we can reach. The thumbs should touch in performing this movement, and the hands should turn so that as they enter the water the backs of them meet. The palms are then ready to present as large a propelling surface to the water as possible when the arms are brought in a wide and powerful circular sweep just under the surface, until they lie straight along each side of the body. The legs are brought up and kicked out just as for the breast-stroke. Should the arms be tired, they can be folded on the breast and the legs alone worked, the breath being taken during the finish of the kick-out.

### THE SIDE-STROKE AND THE OVER-ARM STROKE

We now come to the side-stroke and the speedier overarm stroke. Turning on our right side, we push out our right arm in a straight line with the body, the fingers and thumb being closed and at right angles to the surface. The palm is then turned outwards and the arm is pulled down strongly, without the elbow being bent, until it points to the bottom. The arm is then drawn in to the body by bending the elbow and turning the wrist inwards, and moved along in front of the chest until it is in a position to push out again from just under the ear. The left, or upper, arm moves alternately in the same way, but the hand cannot go so deep, and the elbow must be bent slightly, otherwise the body would roll forward. The only difference in the movement of the arms in overarm swimming is that the left arm is brought right out of the water and dipped slightly farther in front of the head than the hand reaches when it is not taken out of the water. The breath should be taken when the head rises well out towards the finish of this stroke, and it can be expelled quite easily when the head is under the water while the arm is swung over.

There are at present two forms of leg-stroke used in swimming on the side. In the older method both legs were drawn up under the body and kicked out widely, as in the breast-stroke. In the newer method, now adopted by all the best swimmers, the knee of the upper leg is bent but little, that is to say that the left foot is never drawn up, but kicked slightly forwards. The heel of the under leg is brought back towards the body. Both legs are then brought sharply across each other as in walking, the left leg being straight as it passes the straightened right leg, and not being bent back until it has again crossed the right leg. We can, of course, swim on our left side if it is easier to do so, and it is as well to practise swimming on both sides.

The trudgen stroke of the American Indians remains to be learned by any strong boy or girl who desires to move fast through the

water. It is at first very tiring, and cannot be kept up for long by any but the very best swimmers. Each arm in turn performs a circle through air and water, the palms being turned away from the body as much as possible. The leg-stroke resembles that used in the side-stroke, but it is shorter and quicker.

Some swimmers give a kick for each stroke of the arm, but this is very tiring, and it is perhaps best to kick every time we make a stroke with our stronger arm, taking in breath when our head is well above the water.

### HOW TO DIVE GRACEFULLY

Diving is a valuable and graceful accomplishment for the swimmer. If we see a person drowning, we can always go over the boat or pier feet first, but by arriving in the water head first and arms out we can move easily and quickly take our first stroke. We must learn to keep our feet together, and legs, body, head, and arms in one straight line, as we enter the water. Thumbs should be locked and the backs of the hands uppermost. We come to the surface of the water by raising our arms upwards. In standing on a diving-board, our toes should project over the edge, and the spring taken from the balls of the feet. In diving at the start of a race, we must dive as far out as we can without falling flat, and rise to the surface without a moment's delay, drawing up our legs for our first kick as we do so. We should never dive into water of unknown depth, and our eyes should be opened under the water.

The most important diving, however, is the least showy, and it is the art of going to the bottom from the swimming position. By lowering the chin on to the chest, rounding the back and swimming downwards, with the arms, the legs are brought up and out of the water, and their weight then drives the body down, and by swimming with the head kept well forward the bottom can be reached.

### TRICKS IN THE WATER

There are many tricks that can be learned, such as swimming like a dog or crab, swimming with arms and legs tied, swimming like a porpoise, the nautilus, and somersaults on the surface of the water, and some of these strokes are shown in the picture on page 3818.

It is sometimes necessary to remain stationary by treading water. We literally tread water as though walking upstairs, or perform the leg-stroke used in swimming on the breast while the body remains in an upright position.

There are certain things that we must not do in bathing. We should on no account enter water beyond our own depth until we can swim at least fifty yards without a rest. In learning we should never use cork belts, bladders, or water-wings, as these prevent the body from taking its natural position in the water. They have been known to slip, and thus cause the wrong part of the body to float and the head to sink. We must not hurry our strokes in learning. It is quite surprising how slowly we can take our strokes and make good progress. We should never bathe within half an hour after a meal, or at any time when very hot, very cold, or very tired.

# MAKING MAPS IN SAND

SAND MODELLING has always been a favourite of the annual seaside holiday. Boys and girls, whether young or old, have delighted in building castles and then watching the incoming tide creep lower and closer until the first time waves wash the outer wall and the whole building is a leigh swallow. This is the reason why sand modelling should be enjoyed only at the seaside. Many of our public parks have sand pits expressly built for this purpose. And sand is so cheap that with care it can be used even on a table top. We can spend a very enjoyable time modelling in the flat home either in the garden or in the house, and the models that we can make will teach us how to build larger ones on the beach during the holidays.

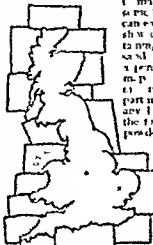
We have all seen maps of countries which are called relief maps. These look as if a print graph of the country has been made in such a way as to show its plain, the mountains and valleys. So the map may be cut out and by two layers is shown in shape. Truly these maps are made of clay or plaster and are placed in their cast moulds. These are who have tried to make a relief map of sand, and a natural out attempt have failed. It is needed the clay or plaster sand which is used in this work and a few ways in which we shall give everyone a try that is likely to be a success.

The first step is to get a piece of paper and a piece of sand. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse.

The second step is to get a piece of paper and a piece of sand. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse.

Carefully remove the piece of paper one at a time without touching any of it. Then, when all shall be finished, let it be a perfect model of sand of the shape which we want.

Having got the idea of how to work, make a relief map. We shall now get some sand and make a model. It can easily be procured by cutting a piece of sand there be any difficulty. To make a relief map, the sand is used in the following way. A piece of sand is used to make a large map. We shall now do the same in our fairly equal parts. The part in the top of the map is and any time we want to look at the top of the map, that the whole is a fine powder. This dry sand may be taken out and is used in all sorts of ways as a substitute for sand. It is used in the same way as the sand in the map. It is used in the same way as the sand in the map.



The map is pasted on the top of a piece of paper and the sand is used in the modelling in sand.

Our regular map is a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse.



MAKING A RELIEF MAP OF GREAT BRITAIN

The third step is to get a piece of paper and a piece of sand. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse. The paper should be a piece of paper that is not too thick and not too thin. The sand should be a piece of sand that is not too fine and not too coarse.

## THINGS TO MAKE AND THINGS TO DO

from the coast-line as possible, so as not to interfere with the pieces of paper which we must slip underneath the map. One brushful of paste in the centre of the map will be found ample for this purpose. If this protecting sheet is one of blue or green paper, a better effect will be given to the finished model, but this is by no means necessary.

rules should be carefully observed. In the first place these sheets should not overlap one another, in the second place a separate sheet must be employed for different coasts. That is to say, the same piece of paper must not be used for the east coast and also for part of the south coast. A glance at the diagram will show how these sheets are to be



A relief map of Great Britain and Ireland modelled in silver-sand. Any boy or girl can make a sand map like this, showing the mountains rising above the general level of the land, by following the directions in these pages. This photograph is from a relief map by Mr. W. F. Fowler, the inventor of the new method of making maps in sand.

Another way is to fasten our cut-out map to a drawing-board by a few drawing-pins, as seen in the diagram on the previous page. Before beginning a model in sand, slip the loose sheets of paper between the map and the protecting sheet. The success of the model will largely depend upon the way in which these sheets are placed, so the following

placed. It will be noticed that Ireland has been omitted from the diagram. The space between this island and Great Britain is so small that we shall do better if we model Ireland separately and slip it into place when finished. Now take some of the wet sand, and model the mountains by pinching it up into little pinnacles with the fingers. The dampness

will enable these mountains to be modified into characteristic shapes. If a good relief map is available for a country, even a sketch map may be indicated and some of the highest points in the several ranges of it can be given.

Having finished the mountains and hills I will sprinkle the whole lightly with dry sand taking care to keep all sand within the limits of the loose sheets of paper. Or we may simply move them away from the coast line whenever possible in a direction that is perpendicular to the coast line. A slight hand movement will help the superfluous sand on the map to drop clear of the coast line and I will give the map a final appearance. There remains a perfect outline of the country such as cannot be easily obtained by other means, and we have an excellent model or relief map of our country. The photograph on page 38 shows what the map will look like.

For centuries many signs have been traced in the sand by means of a matchstick or represented by lengths of thin cord laid into a shape upon the sand. Letters and other signs may be shown by colored sand or marbles while the railway lines construction, towns and villages may be indicated by matches placed in a row.

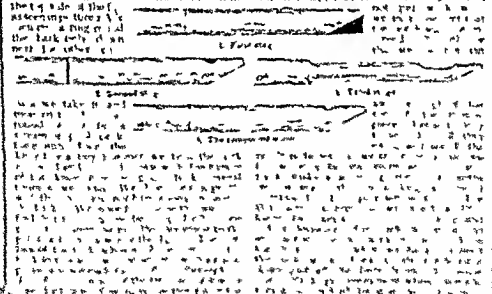
end to end. The various railway systems may be distinguished by justifying these lines different colours. Should we wish this is hard to get, keep it shape for some considerable time we can easily get a good strike with water. The tape we use the more and so quickly on it that with a few days we will have the lines in. It is what should it prove to be kept if but if they are possible it can be in the month enough to model in to light demands or by it more over.

In the same way animals, it seems, fixate and suffer from rolling exercises which require a correct attitude may require to be a child. All we have to do is to find out what the animal and lay his head under it as in the case of the dog. The meaning of the fixed parts may be arrived at only by a little more study as the specimen over which a bed is

To keep the soil from getting too  
riching the farmer uses a machine  
to lay out the 15 feet in each row.  
It sows especially a machine that  
eventual soil tiller, and it gradually  
in the un to be for the it is  
possible to keep it perfectly free and

## A WHISTLE THAT A BOY CAN MAKE

Why we are in the world is something or early something we can make a good world early and quickly. All we need is a little and then there is green pasture and we are that. Can we turn a hand or two? The method of it is a little of a kind. It is not out of the world, it is a little of a force with some strength that will be a little of a little. It is all to be for the good of the world. Let it straight away and then at the same end of a day. A force as soon as it is a little. That may be a little of the whole. We can make a good world.

[illegible]

## A FLEET OF LITTLE BOATS

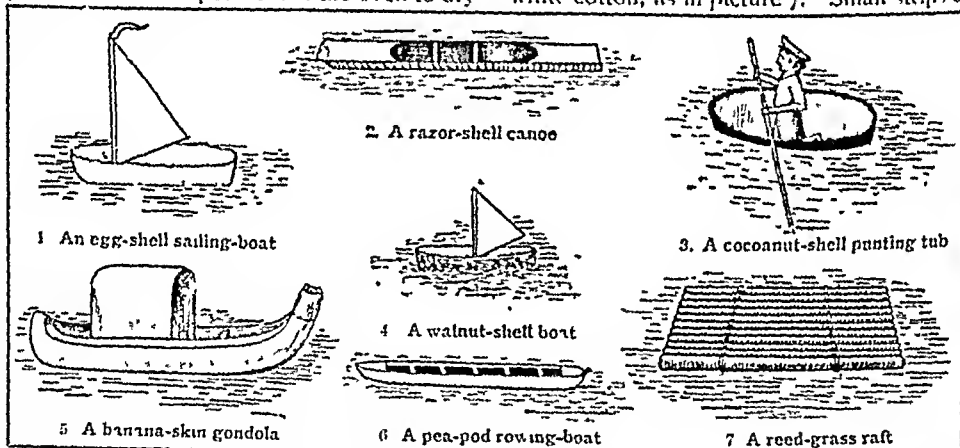
Big boats and small boats, heavy boats and little fairy boats we can make from fruits, nuts, and treasures of the garden and wood. Nimble fingers will soon build our little fleet, and in a big tub or bath, filled with water, we can set the boats afloat.

First we will make a gondola out of a banana-skin, choosing a perfect fruit, well turned up and flat between the ends. We cut down along the middle of the flat part, and through the opening cut the pulp into sections, which can be drawn out on the point of a pen-knife, leaving the skin perfect. Then we curve a piece of thin card, insert it towards the pointed end, and put a match for a seat towards the stalk end. We may have to put a copper coin in the bottom of the boat to steady it in the water. The result is seen in picture 5.

We can make another boat out of half a lemon or a Jiffa orange cut lengthways. We remove the pulp, and trim the edges with scissors, insert strips of card for seats, and put the coracle-shaped boat in the oven to dry

boat. Picture 4 shows us what it is like. The walnut is easy to halve, but not so an egg shell, yet this makes a pretty white boat if we can manage to secure a sound half. Perhaps the best way is first to crack an egg in the middle and from that hole remove the shell in small pieces before carefully taking out the contents. It is better to leave an irregular edge to the shell, as in picture 1, than to risk cracking our boat.

As to the sail for this boat, it can be made of thin white paper fastened to a mast of very stiff paper folded in halves, with one end bent at right angles, so that the bent part can be stuck down to the inside of the boat with sealing wax, while the edge of the sail is gummed into the folded paper that forms the mast. Being fragile, the egg-shell boat may easily be injured in a collision. As shipwrecks do sometimes occur, it is just as well to have a lifeboat or a raft on our miniature sea. A raft might be made of match-sticks, or pieces of reed-grass roped together with coarse white cotton, as in picture 7. Small strips of



and harden. Little wooden dolls to represent ancient Britons, with pieces of wood for oars, can be seated in the coracle.

For a rowing-boat we can use the half of a very large pea-pod with the stalk cut away. Small strips of card will do for the seats, as we see in picture 6, and, if we are skilled in cutting out, we can shape little card rowers with two oars each, made of eard or grass blades.

We know, of course, that coconuts float. So out of the sawn half of one we can make a round punting tub, and in it place a small wooden doll, with a stick for a punting pole, as in picture 3.

All these things make fairly large boats, but there are many things from which we can make dainty little ones. There is, for instance, the half of a walnut-shell. We divide the walnut carefully with a knife, taking pains not to crack the shell, remove the nut, and scrape the inside of the shell clean. As this is suitable for a sailing-boat, we get a piece of stiff white paper, gum one side round a piece of match-stick, and with a little sealing wax secure the mast to the bottom of the

cork, cut lengthways from the corks of bottles, will answer the purpose of a raft, and refuse to sink. Failing any other material, the raft can be shaped from a large flat leaf, such as the plane or ivy.

During the acorn season we probably gathered some acorns with their cups, if so, we have nice little punting tubs ready to be floated at once. An acorn in a cup can serve the purpose of a buoy, if we secure a thread to the stalk and a weight to the other end of the thread, which must, of course, be long enough to reach the bottom of our sea. The acorn can be cut in halves lengthways, the nut removed, and the shell used for a small boat, the flat end forming the stern, and the pointed end the bow.

The petals of flowers float easily on water, so that from them alone we can get dainty small boats of many colours. Red, pink, yellow and white roses will give us variety. As a rose petal is very fragile, a sail, supposing we wish for one, would have to be made of tissue paper, say pink for a pink boat. To form the mast we can roll the paper down one





# A LITTLE VEGETABLE GARDEN

## WHAT TO DO AT THE END OF JULY

WHEN we gather vegetables we ought to know the quantity that will be required, so that we do not take too many. Of course, the surplus can be used next day, but they will not be nearly so nice as they would be if they were freshly cut. In fact, when people say, as they often do, that home-grown vegetables are so much nicer than bought ones, it generally means just the difference that this absolute freshness implies. Even in lifting the early potatoes, only sufficient for the day should be dug up. Always dig up potatoes with a fork instead of a spade, as the spade will probably cut several of them in pieces.

The same rule applies to lettuces or radishes, never cut more than are required for the next meal. In the northern districts of the country a small sowing of cabbages may be made during the last day or two of the month, but in warmer districts the end of the first week in August is a better time for the work, as we do not want the plants to get too forward before the cold weather.

We must see that growing crops are well watered, and keep down the weeds. This is rather a slack time in the garden, so that any work that will keep us forward during a busier season may now be done. Thus, there are our pots and pans. These may have become green or otherwise soiled on the outsides, they should have a thorough scrubbing, and then be allowed to dry. Cleanliness in all gardening operations counts for much, and clean pots are especially desirable. We must never put soil into a wet pot. If we mean to take cuttings of geraniums in greater quantity than we have pots for, we may use boxes, and pot the plants later.

We may not have any potting to do at present, but we may consider here the proper way to pot a plant. We take, then, a clean, dry pot, and we put in the pieces of broken pots that are to form the drainage. Often the novice in gardening will make the mistake of not supplying sufficient drainage. We ought to put in two or three or four pieces, and more if the pot be a very large one. Then over the drainage we lay a morsel of moss,

or quite old straw manure, so that the soil does not get down between the cracks and clog the drainage. On the top of this we put the soil—a portion of it first, then we arrange the plant so that it is quite in the centre of the pot, adding the rest of the soil, and pressing it firmly about the roots of the plant. But we must *not* fill the pot with soil level with the brim, we must leave half an inch or more, according to the size of the pot, so that, when we water, we may really pour the water *into* the pot, which we could not do if it were filled to the brim with soil. This is quite an important little matter.

Perhaps we have bought, or made, a small garden frame. Such a frame is very useful, especially during the winter, when it will give capital protection to young lettuce plants, the seed of which we shall soon be sowing. Now is the time to give a coat of paint to the frame, as this helps to preserve the wood-work from rain and weather.

To return to our flower garden for a moment, there is a piece of garden work that is often required, but which has not yet been described. Let us suppose we have a fine young rhododendron, of which we have tried to strike a cutting and failed. Let us try another method of procuring a young plant from it. We will *layer* a piece to see if we can induce it to root. We make a slanting cut in a branch that is near the ground, making the cut close under a joint, being careful not to cut the branch through, then we lay it along the ground and cover it firmly with extra soil, the branch still, of course, being unsevered. In due time roots will be formed, and, when thoroughly established, we may cut it free and transplant it. But, whereas the rhododendron requires a couple of years before severing, the carnation in our border can be layered at this very season, and by the beginning of October it will be ready to transplant, but then one is a hard, woody branch; the other a soft, juicy stem. The branch or stem being layered should be firmly pegged to the ground before being covered with soil—a hairpin is often used to peg carnation layers.

## ANSWERS TO THE PENNY

### 1 CHANGING SIDES

Calling the empty space 0, and using H for head and T for tail, the moves are as follows

1	H	from 3 to 0	8	T	from 4 to 3
2	T	" 4 " 3	9	T	" 6 " 4
3	T	" 5 " 4	10	H	" 5 " 6
4	H	" 0 " 5	11	H	" 0 " 5
5	H	" 2 " 0	12	H	" 2 " 0
6	H	" 1 " 2	13	T	" 3 " 2
7	T	" 3 " 1	14	T	" 4 " 3
		15 H from 0 to 4			

Although there are many moves, they are easily followed when once the idea is grasped. The great secret is never to get two heads together—until both have passed the three tails—and never to get two tails together.

THE NEXT THING TO MAKE AND THINGS TO DO BEGIN ON PAGE 3973

## PROBLEMS ON PAGE 3724

When this method is properly understood, it is just as easy to do the puzzle with eight, ten, twelve, or any other number of coins.

### 2 HEADS AND TAILS

Although this problem seems difficult, it can be done in four moves. Move the coins in spaces 2 and 3 into spaces 9 and 10, move the coins in spaces 5 and 6 into spaces 2 and 3, move the coins from spaces 8 and 9 into spaces 5 and 6, finally, move the coins from spaces 1 and 2 into spaces 8 and 9.

### 3 PAIRING THE PENNIES

This problem is easily solved by making the following moves: we shift 4 on to 7, 6 on to 2, 1 on to 3, and finally move 5 on to 8.



The wind is as charming with flow as the flagpole. A single plant of the kind we see a  
man not needs. Were it not for birds and insects, the globe would soon over to the waste country

## HOW PLANTS TRAVEL

We already know some of the ways in which the parent plant sends their seeds into the world so that they may have a chance of finding fresh ground where they will thrive. But in addition to the various interesting methods described in page 731 of this book there are other ways in which plants have lit upon in order to make their way to the world.

One of the weeds that grow over in our fields were not known here until recent years and in other parts of our own world they may go to be taken to other countries where they will grow very well. Some of these weeds are when they are taken to a new country flourish so well that they become a great nuisance to the farmers who have been in the land.

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been taken by man without his knowledge. Years ago, before North America was so well peopled by white men as it is to-day, one of our commonest weeds, the plantain, found its way there. Nobody would want to take such a plant with him, for it has no showy flowers, and is not eaten by us. But its seeds went from Europe with the emigrants, and wherever they made their homes, on the prairies and in the backwoods, the plantain sprang up, and the Red Indians gave it a name, they called it the "White Man's Foot."

**HOW THE "WHITE MAN'S FOOT" WAS TAKEN TO AMERICA**

No doubt they were sure in their minds that it was the white man's foot touching the earth that caused this plant to spring up. It is very likely that the first plantain that grew in North America really did spring up in that manner, but there was no magic in it. Probably some English farm labourer, going to try his future in America, packed up the heavy boots in which he had walked behind the plough at home, and did not put them on again until he reached the new land. Now, if we suppose that a little of the English earth was clinging to the soles of those boots, the mystery is solved. It is almost impossible to take up from our fields as much of the surface soil as will cover a sixpence without having in that soil a number of the seeds of some of our weeds.

St Joseph Hooker once related a little story that made this matter very clear. An exploring party, of which he was one, landed on a lonely island at the other side of the world. No one lived on this island, and the visitors thought that they were the first men that had ever set foot upon it. But soon they came upon some of our common English chickweed, and, using the patches of this plant as a guide, they came to a low mound which was covered by it.

**A SPADL THAT CARRIED ENGLISH CHICK-WEED ACROSS THE WORLD**

The mound was a grave in which a British sailor, who had died at sea, had been buried by his mates. It is almost certain that the spade with which the grave was dug had already been used where chickweed grew, and a few of its seeds had clung

to it, to be brushed off on this far-away island, where it germinated and grew. There are many other stories of the way in which our common weeds have got introduced to other countries where they were unknown before, and we must say something of the way in which plants make their way without the aid of man. Many of the winged seeds, and those that have parachutes or sails, are blown for long distances by the wind. The wind drops them, and they sprout and grow into plants which produce flowers and seeds. The second crop of seeds get blown farther in the same course, or in several directions, and year by year that plant is found farther and farther away from its old home.

The seeds of waterside plants are carried for miles by water—perhaps for hundreds of miles—before they are caught by the muddy bank. The cocoa-nut, that we know so well, is borne by the sea, securely wrapped in its great coat of fibres, from island to island in the Southern Seas. Scarcely has a coral island risen to a level with the surface of the sea before numbers of cocoa-nuts are washed upon it, and there they grow and soon cover the island with tall, graceful palms.

**A CUPFUL OF MUD THAT CONTAINED FIVE HUNDRED DIFFERENT KINDS OF SEEDS**

Hooked seeds cling to the fur of beasts and the feathers of birds, and get carried far away. Birds not only carry seeds, but also bits of water-weeds clinging to their feet, and many birds fly enormous distances when they migrate. Years ago Mr Darwin caught some birds of this kind and washed the mud off their feet, and from it he grew a large number of plants, the seeds of which were in the mud.

To show how easy it was for birds to pick up seeds when they hopped along the shores of muddy ponds—into which millions of seeds are washed in rainy weather—he took three table-spoonfuls of mud from a little pond and put it into a breakfast-cup. There were many seeds in it, and as they sprouted and got large enough for him to see what they were, he pulled each one up to allow room for others, and kept count of them. From that small quantity of mud he obtained no less than 537 plants of various kinds.

# THE DANDELION'S LITTLE PARACHUTES



The dandelion, it is we all know so well, was much used and appreciated by our forefathers for salads and as a medicine. Even now it is known in the form of dandelion salad to people who suffer from indigestion.



Here is the plant after it has gone to seed. The young ones have fallen off and in their place there is a fly of seedling like the one of dandelion. It only needs a gentle puff of wind to set it flying.



This is the seed of the dandelion. It is a very small seed, but it is so light that it can be blown away by the wind. It is like a little parachute, and it can fly for a long time before it falls to the ground.



When the seed of the dandelion is blown away by the wind, it is like a little parachute. The seed is very light, and it can fly for a long time before it falls to the ground. It is like a little parachute, and it can fly for a long time before it falls to the ground.

We cannot walk through a field or wood in summer or autumn without a large number of seeds clinging to our clothes, and though some of these will get knocked off again very soon, we shall find many still clinging to us when we reach home. Even in the case of those seeds that have been shaken off, the purpose of the plant has been served by their being carried some distance away, where they may find a more suitable soil and have more room to grow.

#### DIFFERENT KINDS OF PLANTS THAT GROW IN DIFFERENT KINDS OF PLACES

Nearly all plants have their special liking for certain places in which to grow, and the people who make a study of them—*botanists*—they are called—know the exact kind of place in which to look for any plant they want. There is one set of plants we shall never find away from watersides or marshy ground. Others we must look for on peat-bogs. The field flowers differ from those we find in the woods, and these again are unlike those we get on the hillside or on the open downs.

The mountains, with their shallow soil and bare rocks, have their own plants, and many of them will not grow in the richer and deeper soils of the lowlands. Some of them go farther than this in their likes and dislikes, they must have a distinct kind of soil. For instance, this one will only grow upon soils of which chalk or lime forms part, that one will surely die if planted in soil that contains any lime. One must have a loose, sandy soil, while another prefers a stiff loam or clay, and so on.

Then they are particular about the amount of light they get, one insisting upon shade, another thriving only in full, hot sunshine. One likes to have the salt-laden sea-breezes blowing upon it, another cannot live anywhere near the sea. And thus it is that in the tropics we shall find a set of plants quite distinct from those in cold climates, or in our own temperate region.

#### WHY SOME OF OUR PLANTS WILL GROW ONLY IN HOUSHOUSES

That is why, when plants are brought to our gardens from India and South America, we have to grow them in hothouses, and the plants from those countries warmer than our own, but not so hot as the tropics, we protect in greenhouses, where they will be safe

from any touch of frost. The plants that grow high up in the mountains we call Alpine plants, and for these in gardens we have to provide blocks of stone under which their roots will find coolness and moisture, that enables the leaves and flowers to stand the full glare of the sun.

A number of plants can only grow on the remains of other plants. An example of this kind will be found in the bird's-nest orchid, which has no leaves, and is of one dingy yellow-brown colour all over. Other plants fasten their roots to the roots of their neighbours, and rob them of the food these roots are getting from the soil. But these have green leaves, and work up the raw food they have stolen into leaf-stuff and flower-stuff. They are known as root parasites, and in this class come the cow-wheats, the eye-bright, the red and yellow rattles, and the house-wort, that grows in marshy places.

The mistletoe is only a partial parasite, for it has green leaves. Other plants, like the broom-rapes and the dodders, are wholly parasites, taking everything they require from their victims, and not putting forth a single leaf, or having a spot of green colour about them. All these we shall have to talk about in their proper turn.

#### THE MOULD, WITHOUT WHICH PLANTS WOULD STARVE TO DEATH

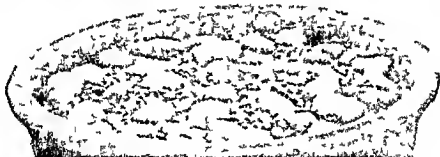
We have already seen that all but the very tiniest of plants must have *mould* to grow in, and that this must be made by plants. If we were to dig up pure clay or sand from deep down in the earth and try to grow plants in it, we should find most of them would fail. They would be starved because, although they want this clay or sand, they want other things mixed with it.

Mould consists of such soil broken up and well mixed with the decaying leaves and stems of other plants. This makes it lighter and holds moisture, and so enables the fine rootlets to work their way among it and feed upon it. The different amounts of this decaying matter is known as *humus*, and the different kinds suit it for plants of various tastes: for plants have likings just as animals have. The plants that thrive in a beech-wood will not live in a pine-wood, though the amount of light and moisture may be much about the same in both places.

# PLANTS THAT IMITATE OTHER PLANTS



Some plants protect themselves by growing like other plants which are not desired by the enemy. The plant on the left saves itself from being eaten by acting like the pepper plant on the right. The right hand picture shows the dead beetle which has mistaken the poison-springing-nett growing on the left.



This bowl-shaped plant is a species of the genus *Calceolaria* which has been found growing in the mountains of the South American Andes. It has been found growing in the same place as the plant on the right.



The illustration on the right shows a plant which has been found growing in the mountains of the South American Andes. It has been found growing in the same place as the plant on the left.



The illustration on the left shows a plant which has been found growing in the mountains of the South American Andes. It has been found growing in the same place as the plant on the right.

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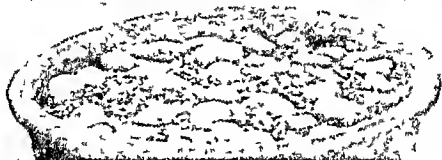
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# PLANTS THAT IMITATE OTHER PLANTS



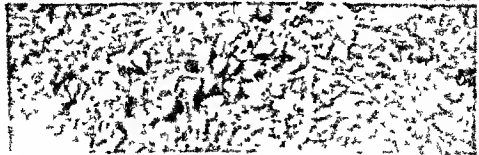
On the left is a drawing of a plant which has no strong odourous power. The plant on the right is a drawing of a plant which has a strong odourous power. The plant on the right is a drawing of a plant which has a strong odourous power. The plant on the right is a drawing of a plant which has a strong odourous power.



Plants, in the East, have been known to take their names from the plants which they imitate. For example, a plant in the East is called 'the plant which has no odourous power' because it has no odourous power.



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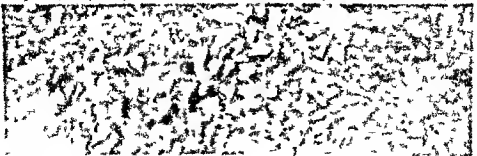
Some plants pretend to be other plants. The mimosa on the left looks like a mimosa, but it is a mimosa. The mimosa on the right looks like a mimosa, but it is a mimosa.



This is a mimosa. It looks like a mimosa, but it is a mimosa. It is a mimosa.



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# THE PLANT'S GREAT STRUGGLE FOR LIFE



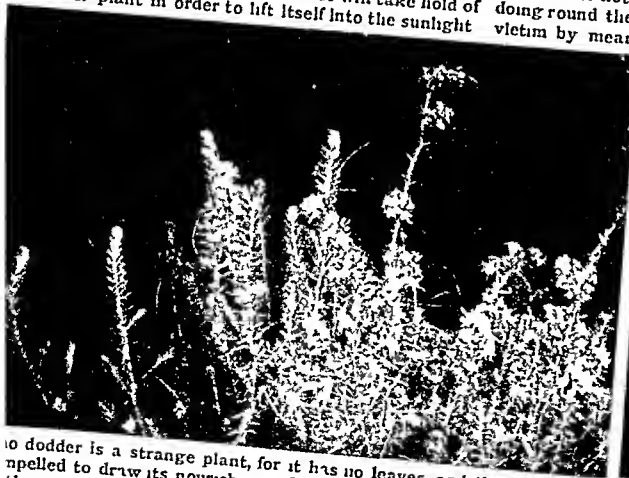
This picture shows a curious New Zealand fungus growing out of the body of a caterpillar. In the vegetable world the fight for life is as keen as among animals. Here is a grass-blade that on the left growing out of through a hard root. Here is a tropical fungus like that on the left growing out of an insect which it has killed.



One of the best known of our climbing plants is the convolvulus, shown in this picture. It will take hold of any other plant in order to lift itself into the sunlight.



The dodder not only climbs round other plants, as it is doing round the nettle here, but it attaches itself to its victim by means of circular discs, and feeds upon it.



So dodder is a strange plant, for it has no leaves, and this is why it is compelled to draw its nourishment from the plant upon which it grows. In this picture we see the dodder climbing up and strangling the heather. Here we see part of the same dodder magnified. The flowers belong to the dodder, and not to the heather.

# SLEDS THAT TRAVEL LONG DISTANCES



The seed pod of the soybean is long and curved, with a thick outer coat of animals. The pod is the rounded shape of a bean, but the seed is a small, oval shape.



A dandelion seed head is shown on a long, thin stem. The seed head is a cluster of small, round seeds.



The seed is a long, oval shape, with a thick outer coat. The seed is shown in profile, with the outer coat and the inner seed visible.



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The seed is a long, oval shape, with a thick outer coat. The seed is shown in profile, with the outer coat and the inner seed visible.

# THE PLANT'S GREAT STRUGGLE FOR LIFE



This picture shows a curious New Zealand fungus growing out of the body of a caterpillar. In the vegetable world the fight for life is as keen as among animals. Here is a grass-blade that has forced its way through a hard root. Here is a tropical fungus like that on the left growing out of an insect which it has killed.



One of the best known of our climbing plants is the convolvulus, shown in this picture. It will take hold of any other plant in order to lift itself into the sunlight.



The dodder not only climbs round other plants, as it is doing round the nettle here, but it attaches itself to its victim by means of circular discs, and feeds upon it.



The dodder is a strange plant, for it has no leaves, and this is why it is compelled to draw its nourishment from the plant upon which it grows. In this picture we see the dodder climbing up and strangling the heather.



Here we see part of the same dodder magnified. The flowers belong to the dodder, and not to the heather.

# The Child's Story of THE EARTH



A boat must be weighted at the bottom to lower its center of gravity to below the point of buoyancy. The boat will then rock but not tip over. If however by putting a weight on deck we raise the center of gravity above the point of buoyancy the boat will tip over.

## THE PULL OF THE EARTH

There is a term connected with gravity which we must understand and which we shall find will throw light on what we have already learnt about equilibrium: this is the term *centre of gravity*. In the case of any object there must be a place we can imagine a point around which the whole of the body could be balanced. The amount of matter in the body would be so distributed all round that point that if it were hung by a thread at that point it would stay at that position. It would balance perfectly around that point. It was as if all the matter of the body were really made together at that point which we call the centre of gravity. Probably a better term would be *centre of mass*.

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We have possibly noticed how large a number of seeds one plant will produce in a season. In all plants the number is very large, in many such as the oak-tree, which drops thousands of acorns every autumn, it is enormous.

**WHY PLANTS THAT SCATTER MILLIONS OF SEEDS DO NOT SPREAD OVER THE EARTH**

A single poppy-head bears countless tiny seeds. One foxglove plant scatters one million and a half of seeds. Yet in the place where they grow, if we watch year by year we shall find that the numbers of poppies and foxgloves are always much about the same. The wood will appear to have only as many oaks in it this year as it had ten or a hundred years ago and the reason for this is quite plain.

Every plant has its enemies—slugs, insects, birds, and beasts—eating its seeds, killing its seedlings, or hurting the full-grown plants. The greater the dangers a plant has to face the larger will be the number of seeds it has to produce to ensure that one of its children shall grow up to produce flowers and seeds in its turn, and so keep the race going. If in autumn we look along the woodland banks where foxgloves grow, we shall find the seedlings coming up thickly together.

Now, if we consider how large the leaves of the foxglove become before they send up their flowering stems, we shall see that there is not room for them all. What happens? They are not all as strong and healthy as each other, and so the strongest and best fitted to produce flowers starve and smother the sickly ones. That is one reason why the stem of the foxglove sways in the wind, and the mother plant tries to throw her seeds as far away as she can, to give all her children a chance of coming up. But still the sickly ones must suffer and eventually be starved to death. It seems very cruel, but it is only in that way that the fine vigour of the race can be kept up.

**THE THOUSANDS OF LITTLE OAK-TREES THAT FAIL IN THE RACE OF LIFE**

Of the many thousands of acorns that an oak will ripen in a good year, by far the greater number never have a chance to sprout. Deer, pigs, squirrels, and mice will eat them, so will the jay and other large birds. But still, if we go to the oak-woods in May or June,

we can see that vast numbers of seedling oaks, a few inches high, have shot up, and are standing in crowds under the trees. Very few of them will be alive at the end of the year, for some of the many oak-eating insects will destroy them; rabbits will nibble them to the roots; and the only acorns that appear to have a chance of becoming trees are those that have been dropped by a jay or rook in the field or hedgerow, and just one here and there that has managed to fall in some spare corner of the wood. All this huge supply of acorns is to ensure that the race of oaks does not die out.

If a big oak happens to have been cut down by the woodmen, or is struck down by lightning, it leaves a great clear space in the wood that used to be shaded by its long branches. In such a space thousands of seedling oaks will come up, and as they will here get more light and air than they would where the trees are close together, they will grow more quickly and strongly, and a few will escape their enemies.

**HOW THE OAKS OF THE FOREST WORK TO PRESERVE THEIR RACE**

But the struggle will still go on between these little oaks, until the one strong tree will conquer the others, and fill up the space that the fallen tree once filled. To fill up that space, and to extend the wood on all sides, all the oak-trees in the wood produce their crops of acorns.

What has been said about the foxglove and the oak applies to all plants. Scarcely one attains to its full size without having fought hard for its life. Even if an acorn is dropped in the middle of a field by a jay, or gets there by some other means, it has to fight in its early days with the grasses, and if it succeeds in getting to the height of a few feet, it may be so injured by horses or cattle nibbling at it or trampling upon it that it dies.

Thousands of young trees spring up from winged seeds, far away from their parents, and struggle for years against browsing sheep and cattle, and never get higher than the grass. But if they happen to fall into the hedgerow, and can grow up to the light, they may in the end win the fight, and, by shutting out light and air from the older bushes, kill those that attempted to kill them.

The next Stories of Plants is on page 394

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WHEN A THING IS STEADY AND WHEN IT IS CHANGING

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until the centre of gravity *did* come to lie under the string. The only real way to understand this—which is perfectly simple—is to draw a diagram for ourselves as we read it. First, we can draw a diagram showing what really happens, then we can draw a diagram showing the board with the centre of gravity to one side of the line downwards from the string, and then we can see how the couple of forces is bound to rotate the board or turn it round.

#### HOW WE MAY FIND THE CENTRE OF GRAVITY OF A BOARD OR A PLATE

Now, we laid down no condition as to the point that the board was to be hung from. No matter from where it is hung, what we say is true. Suppose, then, that we hang it up again from some second point, and then draw the line downwards from the string, the centre of gravity will be somewhere in that line, as we said before, but we know that it is also somewhere in the first line we drew. Now, there is only one point which is common to both lines, and that is the point where they cross each other. The centre of gravity of the board is there. If we have made our experiment precisely, and if we can attach a wire or a thread to the board exactly at that point, we shall find that the board will hang evenly around it on all sides. Of course, we can try the same experiment with a plate, or a slate, or any similar flat object.

If we take such a complicated thing as the human body, we certainly cannot easily find its centre of gravity. The body is very irregular in shape, and it is made of different parts of very various densities. Nevertheless, it has been possible by long study to find one deeply interesting fact. It is one of the most important facts of the whole body, because upon it depends the erect attitude, which means the freedom of the hands from purposes of walking, and the chance to make use of them for all the great human purposes.

#### THE GREAT JOINT THAT DIVIDES OUR BODY INTO TWO HALVES

If we look sideways at anyone walking, or if we look sideways at a skeleton, we can see that the hip-joints make the great joint which really divides the body into an upper half and a lower half. As we know very well, the trunk and head and arms can swing backwards and

forwards upon the lower limbs at the hip-joint. Now, suppose a line were drawn straight down to the earth from the centre of the hip-joints of anyone who is standing. We have here a problem, as we can readily see, which is very like the problem of the board hung by a string. In this case the support is below instead of above, but that does not really matter.

Now, if we understand the principle of the centre of gravity, we can see for certain what must happen to the upper part of the body, as it is supported through the straight line down to the earth, from the hip to the heel. If the centre of gravity of the trunk and head lies so that the line dropped from it to the earth will lie in front of the line from the hip-joint to the earth, then the body must topple forwards. The centre of gravity of the upper part of the body is found in front of the line through the hip-joints in the case of all animals, like the horse and cat, and so on, and that, of course, is why they have to walk as they do. Only by muscular effort and a certain degree of skill can a horse or a dog walk on its hind legs.

#### WHY IT IS DIFFICULT FOR BABIES AND ANIMALS TO STAND UPRIGHT

Even of the man-like apes, including the wonderfully erect gibbons, which we may see any day at the Zoo, it is true that the centre of gravity lies in front of the hip-joints. They can walk very well for a time, but it costs them labour, and they can scarcely stand. A very small baby is in exactly the same plight as these animals.

But as the baby grows the curve of its backbone changes in such a way that the centre of gravity of the trunk now lies, as it does in all of us, behind the hip-joints. The two lines dropped to the earth, one from the hip-joints and the other from the centre of gravity, are parallel, and the forces acting through them make a couple, so that the trunk and head tend to rotate and roll backwards to the ground at the hip-joints, leaving the legs erect. That, however, is a thing which we never saw accomplished even by the most skilful acrobat.

It is prevented by the special development in our bodies of two huge bands of fibres, one in front of each hip-joint, which prevent the trunk from rolling backwards under the influence of

gravity. This beautiful arrangement means that instead of standing upright only by muscular effort and careful balancing we can do so in virtue of self-acting mechanical principles. Some one may say that all this is not the story of the earth, but the body is the child of earth and the laws of the earth act in it and upon it and the body is successful in so far as it obeys and is adapted to the laws of the earth.

WHEN A THING IS STADY AND WHEN IT IS UNSTADY

We have already studied the various kinds of equilibrium and to learn their names—stable, unstable and neutral—but of course we ought to be able to define the exact causes which make the difference between the equilibrium that is stable or steady and those that are neutral and unstable. Our study of the centre of gravity explains this. The simple law is that an object is in a state of stable equilibrium when the centre of gravity is raised by any disturbance but it is in a state of unstable equilibrium if anything that disturbs it lowers the centre of gravity.

All this is quite plain if we think of the centre of gravity as the place where all the stuff of the body may be supposed to be collected. Now if anything is poured toward it it point as for instance when we push against something coming from a side then when the force which raised it ceases it attracts gravity which is always acting just the other way to where it was before. Thus it true of any case of stable equilibrium as when a ball is on a hill or a tumbler. But of course if the disturbance here pulls down the centre of gravity then it will not return to its original position. Hence we do not expect that a ball will return to its original position if it is disturbed.

HOW AN EGG MAY ILLUSTRATE THE THREE KINDS OF EQUILIBRIUM

We can easily test these three kinds of equilibrium by using an egg. If we place the egg on its end it is in a state of unstable equilibrium. If we place it on its side it is in a state of neutral equilibrium. If we place it on its broad end it is in a state of stable equilibrium. The egg is a very good example of these three kinds of equilibrium.

centre of the egg. Now we may roll the egg along the table by pushing it just as we may roll a ball. In a little while it will stop and will come to rest. The force which has raised it will be lowered the centre of gravity of the egg. It will remain in a neutral position.

Put it in a state of unstable equilibrium by pushing it in a side so that it will fall either end we will find that after it falls and comes to rest it will come back to its old position. So for an egg which is in a state of unstable equilibrium it will come back to its old position.

If we place the egg on its side it will remain in a neutral position. If we push it a little it will come back to its old position. If we push it a little more it will come back to its old position. If we push it a little more it will come back to its old position. If we push it a little more it will come back to its old position.

A COMMON MISTAKE THAT HAPPENS WHEN WE FORGET THE LAW OF GRAVITY

The common mistake that happens when we forget the law of gravity is that we think of the centre of gravity as a point in space. In fact it is a point in the body. If we forget this we will make mistakes in our calculations. For example, if we think of the centre of gravity as a point in space we will think that it is the same for all objects. But it is not. It is different for each object.

Times as we have seen, the centre of gravity is a point in the body. It is not a point in space. It is not a point in the air. It is a point in the body. It is a point in the body. It is a point in the body.

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If we take such a complicated thing as the human body, we certainly cannot easily find its centre of gravity. The body is very irregular in shape, and it is made of different parts of very various densities. Nevertheless, it has been possible by long study to find one deeply interesting fact. It is one of the most important facts of the whole body, because upon it depends the erect attitude, which means the freedom of the hands from purposes of walking, and the chance to make use of them for all the great human purposes.

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# THE PULL OF THE EARTH

depend, upon forces we know that all rest and all states of motion depend upon the relations between forces and we know that there is a constant force of gravitation always acting and always acting equally.

So long as we have only gravitation to reckon with our problem is simple. Anyone can make a boat that will float on still water or a balloon that will stay right way up in still air or even a toy flying bird that will do the same. The difficulty arises when we have to reckon with other forces which vary to any degree in their direction and in their strength. That is the problem



The pictures show how we may find the force of gravity of a body which is not at rest. We assumed in both cases that the body is at rest and when it moves we find that it is not at rest and when it moves we find that it is not at rest.

for the machine that is to fly in the air no matter what the air is doing. The case is made especially difficult by the fact that if the machine is to carry passengers, it must retain its right position always, it cannot be allowed to turn over and then right itself. That is the one case yet in which the problem can be solved.

A still simpler problem is that of a body which is at rest and which is not at rest. The problem is to find the force of gravity of a body which is not at rest and which is not at rest. The problem is to find the force of gravity of a body which is not at rest and which is not at rest.

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have. But the difficulty is that of degree. There are many things which the bird can do which we cannot do and that is the difficulty in almost any state of the art. The careful study of the bird by observers of the bird has been called in the past the study of the bird. The study of the bird has been called in the past the study of the bird.

So far as we can learn at present it seems that the success of the bird is success which only in the future can be at any rate in the future.

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POINT THAT DIVIDES OUR TWO HALVES

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## WHY IT IS DIFFICULT FOR BABIES AND ANIMALS TO STAND UPRIGHT

Even of the man-like apes, including the wonderfully erect gibbons, which we may see any day at the Zoo, it is true that the centre of gravity lies in front of the hip-joints. They can walk very well for a time, but it costs them labour, and they can scarcely stand. A very small baby is in exactly the same plight as these animals.

But as the baby grows the curve of its backbone changes in such a way that the centre of gravity of the trunk now lies, as it does in all of us, behind the hip-joints. The two lines dropped to the earth, one from the hip-joints and the other from the centre of gravity, are parallel, and the forces acting through them make a couple, so that the trunk and head tend to rotate and roll backwards to the ground at the hip-joints, leaving the legs erect. That, however, is a thing which we never saw accomplished even by the most skilful acrobat.

It is prevented by the special development in our bodies of two huge bands of fibres, one in front of each hip-joint, which prevent the trunk from rolling backwards under the influence of



## JOHN ANDERSON

'His famous song,' is a love song—with a difference. In it Robert Burns pictures a happy couple not at the beginning of their married life, but towards its close, and it says much for the enduring affection each has cherished for the other that the old lady is able to sing so tenderly of her 'jo' or sweetheart. The Scots words in the song are easy to understand, but "brent," it may be said, means smooth or unwrinkled "pow," head, and "canny," happy.

JOHN ANDERSON, my jo, John,  
When we were first aequint,  
Your locks were like the raven,  
Your bonnie brow was brent,  
But now your brow is bald, John,  
Your locks are like the snow,  
But blessings on your frosty pow,  
John Anderson, my jo

John Anderson my jo, John,  
We clamb the hill thegither,  
And mony a canny day, John,  
We've had wi' ane anither,  
Now we mairn totter down, John,  
But hand in hand we'll go,  
And sleep thegither at the foot,  
John Anderson, my jo

## SILVIA

It has been said that when a character in one of Shakespeare's plays "favoured" the audience with a song, this happened when the company contained a man who was both an actor and a singer. Though these songs were not numerous, they were perfect examples of the divine art, and one of the most charming is that here quoted. It occurs in "The Two Gentlemen of Verona," and has been set to music worthily of it by the famous German composer Schubert.

WHO is Silvia? What is she,  
That all our swains commend her?  
Holy, fair, and wise is she,  
The Heaven such grace did lend her,  
That she might admired be

Is she kind as she is fair?  
For beauty lives with kindness  
Love doth to her eyes repair,  
To help him of his blindness,  
And, being help'd, inhabits there

Then to Silvia let us sing,  
That Silvia is exelling,  
She excels each mortal thing  
Upon the dull earth dwelling  
To her let us garlands bring

## THE SHEPHERD BOY SINGS IN THE VALLEY OF HUMILIATION

John Bunyan, whose "Pilgrim's Progress" is the greatest allegory in the world, wrote very little verse. But the snatches of poetry he introduced here and there into his story were quaintly expressed. The song which he placed in the mouth of the Shepherd Boy in the Valley of Humiliation, however, is entitled to the highest praise, even on the literary side. The lad had already found out the secret of true happiness and peace. A contented mind is a continual feast.

HE that is down needs fear no fall,  
He that is low no pride,  
He that is humble ever shall  
Have God to be his guide

I am content with what I have,  
Little be it or much,  
And, Lord, contentment still I crave,  
Because Thou savest such

Fulness to such a burden is  
That go on pilgrimage,  
Here little, and hereafter bliss,  
Is best from age to age

## THE VOICE OF TOIL

William Morris, born 1834, died 1896, was famous as a poet as a writer of romance, and a lover of the fine arts. His sympathy with the poor and oppressed in the battle of life was so deep and abiding, that much of his writing is devoted to advocating the cause of the workers. The following poem is, in a way, a battle cry to do service on behalf of the poor.

I HEARD men saying Leave hope and praying,  
All days shall be as all have been,  
To day and to-morrow bring fear and sorrow,  
The never-ending toil between.

When earth was younger, mid toil and hunger,  
In hope we strove, and our hands were strong;

Then great men led us, with words they fed us  
And bade us right the earthly wrong

Go read in story their deeds and glory,  
Their names amidst the nameless dead;  
Turn them from lying to us slow-dying  
In that good world to which they led;

Where fast and faster our iron master,  
The thing we made, for ever drives,  
Bids us grind treasure and fashion pleasure  
For other hopes and other lives

Where home is a hovel and dull we grovel,  
Forgetting that the world is fair;  
Where no babe we cherish, lest its very soul  
perish,

Where mirth is crime, and love a snare

Who now shall lead us, what god shall heed us  
As we lie in the hell our hands have won?  
For us are no rulers, but fools and befoolers,  
The great are fallen, the wise men gone

I heard men saying Leave tears and praying,  
The sharp knife heareth not the sheep  
Are we not stronger than the rich and the  
wronger,

When day breaks over dreariness and sleep?

Come, shoulder to shoulder, ere the world  
grows older!

Help lies in nought but thee and me,  
Hope is before us, and the long years that  
bore us

Bore leaders more than men may be

Let dead hearts tarry, and trade and marry,  
And trembling nurse their dreams of mirth,  
While we the living our lives are giving  
To bring the bright new world to birth

Come, shoulder to shoulder, ere earth grows  
older!

The Cause spreads over land and sea,  
Now the world shaketh, and fear awaketh,  
And joy at last for thee and me

## THE CONCLUSION

Sir Walter Raleigh was accused of treason and imprisoned in the Tower, where he was beheaded in 1618. While lying in prison he wrote a "History of the World." He also wrote several poems, of which we give here a short specimen, the melancholy tone of which points to its having been composed within the shadow of death. But Sir Walter's high courage does not desert him, and his faith in God is supreme.

EVERY such is time, that takes in trust  
Our youth, our joys, our all we have,  
And pays us but with earth and dust,  
Who in the dark and silent grave,  
When we have wander'd all our ways,  
Shuts up the story of our days,  
But from this earth, this grave, this dust,  
My God shall raise me up I trust



Three little girls were sitting on a rail  
Sitting on a rail  
Sitting on a rail  
Three little girls were sitting on a rail  
On a fine hot day in September

What did they talk about that fine day  
That fine day  
That fine day  
What did they talk about that fine day  
That fine hot day in September

The crows and the cats they talked  
about  
Talked about  
Talked about  
But nobody knows what they said  
On that fine hot day in September



Five little girls were sitting on a rail  
Sitting on a rail  
Sitting on a rail  
Five little girls were sitting on a rail  
On a fine hot day in September

What did they talk about that fine day  
That fine day  
That fine day  
What did they talk about that fine day  
That fine hot day in September



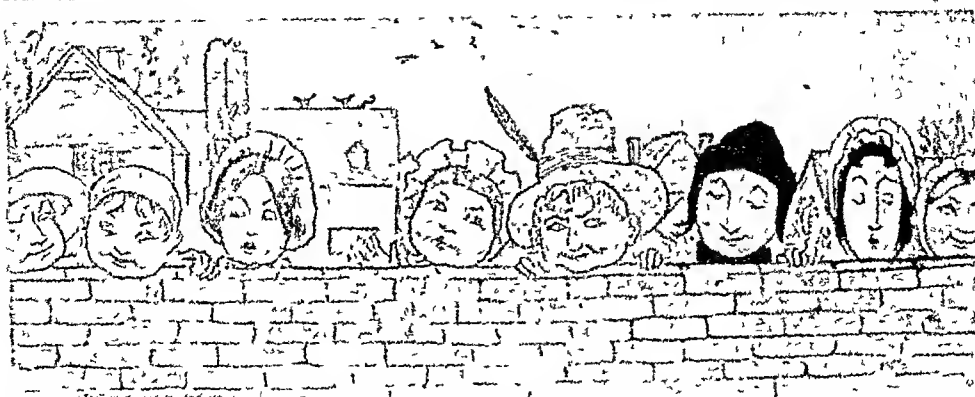
Three little girls were walking in a line  
Walking in a line  
Walking in a line  
Three little girls were walking in a line  
On a fine hot day in September  
But somewhere  
We can't find  
And we can't find  
The name of the day

Little Miss Muffet sat on a tree  
Have a little tree  
garden was  
The crows and the cats  
they walk  
Agree to disagree  
Make love to Miss Muffet  
In a garden  
travelling day

Three little girls were sitting on a rail  
Sitting on a rail  
Sitting on a rail  
Three little girls were sitting on a rail  
On a fine hot day in September  
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That fine day  
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## THE PEN AND PENCIL OF KATE GREENAWAY

ALTHOUGH so many ladies have devoted themselves to the dainty art of illustrating and writing children's books, perhaps Kate Greenaway, who was born in 1846 and died in 1901 is the only one who became famous all the world over in this way. She was the daughter of a London wood-engraver, and studied art from her earliest years. There is such a charm and freshness about all her little drawings, and so quiet a touch of humour, that both old and young find them full of entertainment. Her simple verses are of less importance than her delightful illustrations, but they are tuneful and appropriate. A selection from her sketches and verses is given on these two pages and elsewhere by permission of the publishers, Messrs. Frederick Warne and Company.

LOOK over the wall, and I'll tell you  
why [by  
The King and the Queen will soon pass  
Madams and masters, look this way  
The King and his Court ride past to-day  
The Queen has a robe that is gold and  
red,  
She is stately, and sits with a crown on  
her head,  
And four very little boys after her go,  
To do as she bids them—they never say  
"No"

The banners are waving, the soldiers are  
drumming,  
'Tis indeed a fine sight that, I tell you,  
is coming!  
So, if you look long enough over the wall,  
You'll see a great deal, if you do not  
see all

UNDER the window is my garden,  
Where sweet, sweet flowers grow,  
And in the pear-tree dwells a robin,  
The dearest bird I know  
Tho' I peep out betimes in the morning,  
Still the flowers are up the first,  
Then I try and talk to the robin,  
And perhaps he'd chat—if he durst



PRINCE FINIKIN and his mamma  
Sat sipping their bohea,  
"Good gracious!" said his Highness,  
What girl is this I see?  
"Most certainly it cannot be  
A native of our town."  
And he turned him round to his mamma,  
Who set her teacup down



But Dolly simply looked at them.  
She did not speak a word  
"She has no voice," said Finikin;  
"It's really quite absurd"

Then Finikin's mamma observed,  
"Dear Prince, it seems to me,  
She looks as if she'd like to drink  
A cup of my bohea"

So Finikin poured out her tea  
And gave her currant-pie  
Then Finikin said "Dear mamma,  
What a kind Prince am I!"



## THE MILLER AND HIS PETS



SCREECHING SHRIED AT SCREWWORK'S SIDE AND LOONING, LI HE SAW THE LIZARD



through the open door, but with the noise the animals at once awoke.

The dog sprang out and bit his leg. Then, as he passed the table, the cat jumped up and scratched his face. The two ducks spread out their wings and flapped about his head, and when at last he staggered to the door, the donkey gave him a terrific kick and sent him flying into a pucky mass of furze and bramble. The robber captain crawled away, and told his men that a murderous gang had captured their hut, and would kill them if they went back.

"One of them," he said, "stabbed me in the leg. Another just managed to graze my face with his knife. Three or four of them flapped a cloth about my head and tried to wrap it round me and stifle me. And just as I thought I had got safely away, someone struck me

in the back with a great sledge-hammer, and pretty nearly killed me."

"We'd better leave this neighbourhood at once," said his men.

They hurried away, more frightened than ever, and never did they return to Bagshot Heath.

In the morning, the dog noticed that the ground had been disturbed in a corner of the hut. Scratching up the earth, he found a large sack full of money. Thus the donkey managed to hoist on his back, and the dog and the cat and the two ducks proudly marched by his side across the heath to the ruined mill. With the money that the animals brought to him, the old miller repaired and stocked his mill and there he lived happily and quietly with all his pets, and often amused himself over the story of the capture of the robbers' treasure.

## A SON OF A GUN

SCREWORM sat down among the toadstools and opened the book which is called "Gnome Gnobodies." In England we have a book called "Who's Who." It tells us about famous people. In fairyland they have "Gnome Gnobodies," which is just the opposite.

In "Gnome Gnobodies" the gnomes read about gnomes who are not famous.

Screwworm opened his enchanting book at the letter T, and turned the pages till he came to the name Tompin. This is what he read:

"Tompin is a duffer, and flighty. He was born on the planet Mars in the year 12, and emigrated to the earth in the year 1066. As he was neither woman nor man, he attached himself to the Normans and followed them to England. His favourite recreation is stroking his chin. He neither reads nor writes. He earns his living by doing nothing. His favourite residence is the muzzle of naval guns, which he prefers to old-fashioned clubs. He can swim backward as well as forward. His present address is H.M.S. Dreadnought, At Sea."

When Screwworm had read this account of Tompin, he said: "That's the little fellow for my money. The very thing."

Something stirred at his side. He looked up, and saw the Lizard.

"Good-evening," said Screwworm.

"Certainly," answered the Lizard.

"How did you find Landsend?"

"Rocky," replied the Lizard.

"Now listen to me," said Screwworm, resting his arm on a toadstool and regarding the Lizard over his glasses. "Do you, or do you not, know Tompin?"

"I've seen him," answered the Lizard, "but I can't say as how I know him. We don't speak. He's a son of a gun."

"Quite so. Now, I've invented a gun myself. It's a beauty. It fires sea-shells on the seashore. The shells are sells, that is to say, the sea-shells it sells are seashore sells. Not Wilkie's, for those are Baid—but Winkle's! Do you follow?"

"You mean to say, your gun fires winkle-shells which are sells, that is to say, they are not genuine. You are using slang?"

"You have me. I use slang for this reason—the mouth of my gun likes it. If you want to make a hit nowadays, you must use slang. I want to make a hit. Do you know what I want to hit?"

"Hush!" whispered the Lizard. "He's here!"

Screwworm turned his head. Tompin was regarding him over a toadstool.

"Good-evening, monsieur. Do you speak German?" asked Screwworm.

Tompin said nothing. His old face had a set smile, which was neither merry nor pleasant. You might have called it a blind smile, or even a dumb smile.



SOME THING SHUDDER AT SCREWORM'S SIDE AND LOOKING UP HE SAW THE LIZARD

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"Don't you speak at all?" demanded Screwworm frowning.

After waiting a long time for an answer, Screwworm got up, laid "Gnome Gnobbies" on the ground, and, walking over to Tompin, said "Come hither, little bird!" Very gently he took the left ear of the old fellow between his finger and thumb and led him away.

"Monsieur," said he, "I have a gun."

Tompin stopped dead. His face quite lighted up.

"What's the matter?" asked Screwworm.

"I am saved," said Tompin—"if it's at all fatherly."

"Explain yourself."

"The British Navy," said Tompin, "is practising gun-fire just now. There is not a single gun that is safe for me to sit in. The consequence is——"

"Yes."

"I am an orphan, a waif, a homeless and fatherless wretch. It is immensely sad."

"You are welcome to sit in my gun. It shall adopt you."

"It won't go off—and leave me?"

"I shouldn't think so."

"Oh, thanks! For this relief, much thanks. Get you to a gunnery as Shakespeare says. I'm your boy. Let us fly to it!"

They continued their way. When they came to Screwworm's gun, the face of Tompin became very green.

"It smells fishy!" he said suspiciously.

"Try it!" said Screwworm.

"I don't like the smell," muttered Tompin, poking his nose in the muzzle and sniffing deeply. "It suggests sea-shells. Too much mussel to be strong. I fear I might be oystered. If you will allow me, I will limpet."

He made to go on, but Screwworm caught him by the ear again, and said:

"Try it, poor orphan!"

"You are sure you don't mind?" asked Tompin.

"Not!"

"Here goes, then!" cried Tompin; and he jumped into the muzzle of Screwworm's gun.

Quick as lightning Screwworm ran to the back of it, struck a match, and applied it to the touch-hole.

A bright flame shot into the air.

Something went *fw-z-z-z-z!* And then there was a tremendous explosion. The air for miles became black with wrinkle-shells.

Thousands and thousands of gnomes came rushing up from all directions. They found the gun lying on the ground smoking hot, and emitting yellow and green flames. Screwworm and Tompin were nowhere to be seen.

Scramblepupe, who was among the company, exclaimed:

"Something has happened!"

At that moment the Lizard appeared in the midst of the group.

"My dear friends," said he "if you will be patient for a few moments, you will see a sight worth seeing. Let me explain. This gun is so perfectly balanced that the pace of the discharge is equal to the pace of the recoil. The force is exactly equal to the circumference of the earth. Now, what has happened? Tompin from the muzzle of the gun and Screwworm from the breech of the gun are now at this moment going round the world. Do you follow me? If you wait a moment, you will see what I mean."

Scarcely had the Lizard ceased speaking when Tompin from the east and Screwworm from the west appeared in the air, rushing towards each other at a pace so furious that all the gnomes instantly rushed for shelter under the toadstools.

"They passed each other half-way round the world," said the Lizard. "Now they will meet and embrace. Bang!"

At that minute the two bodies came together with a whack! Then they fell straight to the earth in each other's arms.

"Did you enjoy it?" asked Screwworm breathlessly.

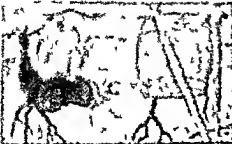
"You have impressed me," said Tompin, with sincere admiration.

For a moment he regarded the gun, still smoking on the ground; then, with a rush of tears to his eyes, and quite overcome with emotion, he fell upon one knee, laid his arms lovingly about the gun, and, pressing his cheek against it, exclaimed:

"Papa, papa, I have come back to you!"

The Lizard turned to Screwworm, and said:

"Let us leave him where he is. The poor orphan is now at peace."



THE ASS IN THE LIONS SKIN

[illegible]

The following are some of the things I have learned from my experience:

THE MOLECULAR AND THE LITTLE FISH


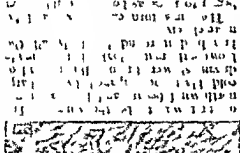
THE ROYAL AND THE LITTLE FAIR

1. The first part of the document discusses the importance of maintaining accurate records of all transactions, including sales, purchases, and expenses. It emphasizes the need for regular reconciliation and the use of standardized accounting practices to ensure consistency and reliability of financial data.

2. The second part outlines the various methods used to collect and analyze market research data. This includes primary research techniques such as surveys, focus groups, and interviews, as well as secondary research sources like industry reports and government statistics. The document also covers advanced analytical tools and software used to process large volumes of data efficiently.

3. The third section focuses on the development and implementation of effective marketing strategies. It details how companies can identify their target audience, understand their needs, and tailor their messaging accordingly. Key concepts discussed include product positioning, pricing strategy, distribution channels, and promotional tactics.

4. The final part of the document addresses the challenges faced by businesses in today's competitive environment. It highlights the impact of technological advancements, changing consumer behaviors, and global economic factors on business performance. Recommendations are provided for staying agile, fostering innovation, and building strong relationships with stakeholders to overcome these challenges successfully.



THE WIND AND THE SUN

# AMY ROBSART

SORT and sad that lady grieved  
In Cumnor Hall, so lone, so drear,  
Full many a piercing scream was heard,  
And many a cry of morbid fear  
The death-bell thrice was heard to ring,  
An actual voice was heard to call,  
And thrice the raven flapped its wing  
Around the tower of Cumnor Hall

WHO was this lady who grieved in Cumnor Hall, and for whom "the death-bell thrice was heard to ring"? She was the daughter of a gentleman who owned great estates in Cornwall, a certain Sir John Robsart, a man of ancient family and great wealth. She was the heiress of this rich landowner, and rumour says that she was exquisitely lovely, a maiden fairer than any other of that age.

We can imagine how happy was the childhood of little Amy Robsart in the West Country. With a father who adored her, peasants who smiled to see the little lady pass, and a home beautiful, comfortable, and prosperous, life must have seemed to her a gift expressly made for her enjoyment. And later her happiness must



AMY ROBSART WAS THROWN DOWNSTAIRS

have been greater still. For there came to visit her, and to make love to her, one of the most striking men who ever walked the earth. This was a certain Lord Robert Dudley, a youth so handsome and so gracious in manner that he was reckoned the Apollo of that age. He was tall, strongly but gracefully formed, with a countenance that might have been chiselled, so fine were the features, so delicate the lines. And instead of having his conversation filled with foxes and horses and dogs and stuff of the stable, he had the soul of a

And in that manor now no more  
Is cheerful feast and sprightly ball,  
For ever since that dreary hour  
Have spirits haunted Cumnor Hall  
The village maids, with fearful glance,  
Avoid the ancient moss-grown wall,  
Nor ever lead the sprightly dance  
Among the grass of Cumnor Hall.

poet for lovely scenery, and the soul of an artist for splendid buildings.

Thus youth had been sent to Cornwall by his father, an ambitious man, who had arranged with Sir John Robsart that his handsome son should marry

the daughter of the rich knight.

After a delightful courtship, and while they were still little more than children, on June 4, 1550, at the palace of Sheen, with King Edward VI present at the brilliant ceremony, Amy Robsart was married to Lord Robert Dudley.

For ten years they lived together, happily at first, but soon with a gradually increasing unrest. Amy came to see that her handsome boy husband was consumed by one overmastering passion—the passion of ambition. He could not be happy

with home life. He wanted to be a figure at court—to outshine all others. He wanted to be a power in the state.

Edward VI. was dead, and the wonderful Elizabeth reigned over England. Lord Robert Dudley pleased that fastidious great lady. She kept him constantly at her side. She showered royal favours upon him. He became the chief jewel of her gorgeous court, and nothing seemed beyond the aspirations of the handsome young courtier. And what became of Amy? She was sent by her husband to Cumnor Hall,





The Child's Book of  
WONDER



WHAT MADE THE MOUNTAINS?





the heat inside the earth. The real questions are: Why does that heat behave as it does? and Is that heat made in any special way when the volcanoes are formed? It is certain that, at its very beginning, a volcano is a hole that is burst in the surface of the earth's crust. Once that hole is made we can understand how the heat underneath goes on using it in future, things naturally find their way out through it, because it is the "path of least resistance," and so a pile of stuff is heaped up round it, and a volcano is made.

But the whole earth is hot. Why did the hole, in the first place, form just there? There are, I think, two answers. The first is that probably the earth's crust at these places is thinner or weaker, or made of material that can more easily be pierced, and, also, as we are just learning, possibly special sources of heat and power lie underneath it, owing to the presence of rocks or materials which contain more than their share of the wonderful element radium, or some other heat-producing element like it.

#### WHAT MAKES THE ROOTS OF TREES GROW IN THE GROUND?

The use of the roots of trees lies in the ground. They serve, first, to give the tree a firm hold, so that the wind shall not upset it. And they are the mouths of trees, as we might say, for a great deal of the food of the tree, which it cannot do without, is sucked up into it out of the ground by its roots. On the other hand, the roots contain no chlorophyll—the green stuff by which the leaves use the light—and so there is no need for them to be exposed.

All this is easy to find out and to understand, but it does not quite answer the question. We know why it is good for the tree that its root should grow into the ground and not into the air, but that does not tell us *how* the roots know in which direction to grow. Certainly gravitation helps them. It does this, not merely by pulling the roots into the earth—for roots strike sideways and not only straight downwards—but it helps by letting the roots know or feel where the earth is. Mr Francis Darwin, the son of Charles Darwin, who showed how the countless kinds of living creatures have come upon the earth, has proved that plants are able to know where the earth

is. They have a gravitation-sense, just as we have a light-sense or a sound-sense, and this helps to guide the roots to grow downwards. Also, the roots grow at their tips, where they get their food in the soil, and so they grow in many directions just where they find the food that they live upon. We can understand how the growing tip of anything will grow towards its food.

#### WHY IS IT THAT TREES GROW STRAIGHT?

If there is a steady wind blowing, or usually blowing in one direction, that wind may bend a tree. Or if it grows near a wall, say, so that the light strikes it unequally on the two sides, it may grow crooked, but a tree usually grows straight because that is the best way for it to grow, and because everything helps it to do so. There is much less strain on its roots if it grows straight and its roots grow about equally in all directions through the ground, and so help to keep it in that position. Also, a tree throws out branches about equally on all sides, so that then weight all round the trunk helps to balance it and keep it straight.

Trees that are able to grow straight upwards are the likeliest to thrive, because growing straight means that there will be space for branches with their leaves on all sides, and so the tree can use more sunlight, and is better fed. There are thus, as a rule, many reasons why trees grow straight. Some of them, like those about the balance of the branches, are what we may call mechanical reasons, and others are deeper reasons depending on the way in which the tree lives, and the way in which, like every living creature, it tries to adapt itself to the conditions of its life, so as to live as well as possible.

#### WHY DO THE BRANCHES OF TREES GROW SIDEWAYS INSTEAD OF STRAIGHT?

Here, again, our best way of understanding why the living creature we call a tree behaves as it does is to find out the use to which it puts its branches. We find that they exist in order to bear the leaves by which the tree breathes, and by which it also feeds on the carbonic acid of the air under the influence of the sunlight. It is the tree's business, then, to grow its branches in such a way that the leaves they bear shall be exposed to the sunlight as fully



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with The most perfectly transparent thing we know will yet stop some light. This is true, for instance, of glass; even the best glass used for the lenses of spectacles. It is true of the purest air, as we soon discover when we climb a high mountain, and find how bright the sunlight becomes when it has to pass through a thinner layer of air on its way to us. If matter has this effect on light, the thicker the layer of matter, the greater the effect will be, and this, of course, is true of metals, as it is true of every kind of matter. The only difference is that metals offer a particular resistance to the passage of light, and so, if they are to let light through, they must be beaten very thin indeed.

#### WHAT IS GRASS MADE OF?

Grass is a plant, or, rather, there are hundreds of plants which are all called grasses. What we call grass in the garden or in the fields is the leaves of this plant—green leaves which play exactly the same part in its life as the green leaves of an oak-tree play in the life of the oak. The oak and the grass, like a rose-bush, are both true flowering plants, and if we take a little trouble we can soon find the flowers of the grass for ourselves. Like other green plants, the grass is made by the power of sunlight out of certain materials in the air and in the earth.

The elements that we find in grass are the same as those that we find in all other living creatures without exception—carbon, oxygen, hydrogen, nitrogen, phosphorus, and a few more. But while we remember that these elements exist in the grass and make it, we must also remember that there is another thing there which is as real as real can be, though we cannot see or handle it. That thing is energy. Grass could not exist if it did not contain energy, which is really the transformed rays of sunlight. This is true of all green plants and of all animals, too. Our bodies actually contain, and could not exist without, some of the sunlight of the past which is stored up in them.

#### WHY DOES A ROPE NEVER LIE STRAIGHT WHEN THROWN ON THE GROUND?

If we can imagine a rope made of sand, and if we could throw such a rope on the ground, then it would lie straight. The trouble is that one cannot make

a rope of sand. The making of a rope at all depends upon something which will always prevent us from throwing the rope so that it will lie straight when we have made it. We can only make a rope of anything that will hang together if there is some kind of pull between the atoms and molecules that make it. If there is no such pull together there cannot be a rope.

If we take a shovelful of sand and throw it out from us, it will fly out in quite straight lines, but when we throw out a rope we are throwing out something of which the molecules are wonderfully bound together in ways which are, at present, far beyond our understanding. Their pull on each other prevents the rope from flying out in a straight line. Perhaps this would not be so if it were possible to make a perfect rope, of which all the parts pulled equally and truly and evenly, and if we could throw this rope out in such a way as to give no bias or favour, to any part of it—a thing quite impossible to do.

#### IF A FEATHER IS LIGHTER THAN AIR WHY DOES IT EVER SETTLE?

Nothing is more certain than that if a feather were really lighter than air, it would never settle. If a feather in time *does* fall to the ground, it must be heavier than air, whatever we may think at first. This is indeed the case. If we were to take all the matter composing a feather, and put it together again in a slightly different form—not the wonderful form that Nature has made it—then it would drop at once.

The business of the feather is to serve the life of a creature that flies, and therefore Nature has made it as light as possible. It is made of a texture that will itself hold air, and it is also spread out in such a way as to take the utmost possible advantage of the supporting power of the air. Yet, like many other things which the air will support for a time, the feather is heavier than the air, and therefore if the air is still, the feather must fall. It falls under the force of gravitation. If the air, however, is thrown into motion by the wind, its motion endows it with a force which may be greater than that of gravitation, and so the feather may be lifted from the ground into the air. Thus, it is all a question of the balance between one force and another.



from all sorts of sources, which are conveyed to his brain by special nerves and give him the ideas which he identifies with all those sensations. Now, if one of these nerves, or brain centres, should be destroyed or absent, the brain has fewer messages to attend to, and so has more time for the rest.

Thus in a blind person there are no means of his getting all the information which comes to an ordinary person through sight, so that if he wants to know how near he is approaching to somebody walking towards him, the only means he has of judging that is by listening to the sound of the foot-step. He cannot see the distance which separates the two. In this way he becomes accustomed to listen deeply for all the sounds around him, many of which he would otherwise not hear at all, and so we find that blind people get into the way of doing so, and, as a result, are extremely quick at hearing.

#### HOW DOES AN EAR-TRUMPET HELP THE DEAF TO HEAR?

If we come to think of it, what we call the ear—that is to say, the outside part—is nothing more or less than an ear-trumpet itself, only the shape is a little different, that is, the external ear is a machine for collecting the waves of sound for the ear and conveying them into the internal ear, from which they pass in turn to the nerve of hearing and thence to the brain.

In people who are deaf it is possible, by using a much larger collecting surface than the ear—that is to say, by having a bigger surface for the sound-waves to beat upon—to make the sound waves reach the inside of the ear with greater intensity, and so stimulate the nerve of hearing. This is what the ear-trumpet does. In human beings the outer ears are not much used for collecting sound, but in some of the lower animals we can see them being used at any time, for example, in horses and dogs, which “prick up their ears,” as we say, in order to catch the sound-waves. So that an ear-trumpet is just an artificial ear for collecting sounds.

#### WHY DOES IT NOT HURT WHEN WE CUT OUR HAIR?

We feel pain when we burn our fingers or suffer from any other kind of injury because almost every part of the body has innumerable small nerves in

it which carry to the brain the sensation of pain. It follows, therefore, that if there were no nerves there would be no pain, and, as a matter of fact, when a doctor wishes to do anything to a patient which would be very painful, he uses some means to deaden the endings of the nerves in the skin. Now it so happens that our hair, like our nails, has no nerves, and therefore may be cut off without causing any pain at all.

#### WHY DOES HAIR GROW AFTER THE BODY HAS STOPPED GROWING?

Certain parts of the body are capable of growing into certain definite shapes and sizes and no farther, whereas other parts of the body have the capacity to keep on growing as long as the body itself is alive. Thus, a bone in the leg grows to a certain size and then stops, and nothing we can do to it can make it grow any bigger. On the other hand, structures which are meant to protect the body, such as the skin and hair, are constantly being worn away, and are reproduced as quickly as they are lost.

#### WHY DOES SALT MELT THE SNOW?

We are all familiar with the instrument known as the thermometer, which was invented by a man named Fahrenheit, who lived from 1686 to 1736. He found that the lowest temperature he could obtain was got from a mixture of ice and salt, and in order to make a scale to measure heat he called the temperature of this mixture 0 degree, and the temperature of boiling water he called 212 degrees.

Now, on such a scale the freezing-point of water was 32 degrees, so that we say that it is freezing when the thermometer stands at 32 degrees Fahrenheit.

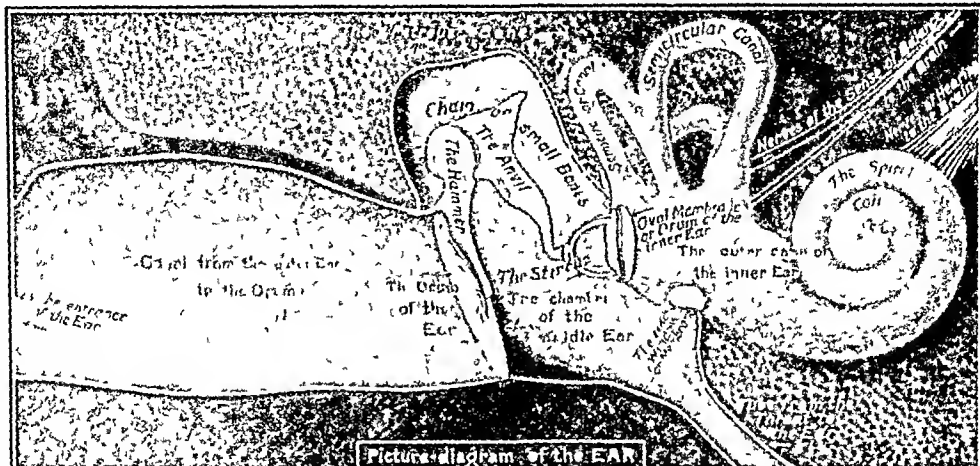
When salt is mixed with ice or snow in this way, the process of mixing changes the salt, ice, or snow into a liquid, but the temperature of that liquid is considerably lower than the temperature of freezing water or snow, so that we see one of the most striking effects of heat is its power of changing the physical condition of matter.

In this particular case it changes the salt, ice, or snow into liquid, but as that liquid requires a much colder temperature to freeze it than water does, the snow is slowly melted.

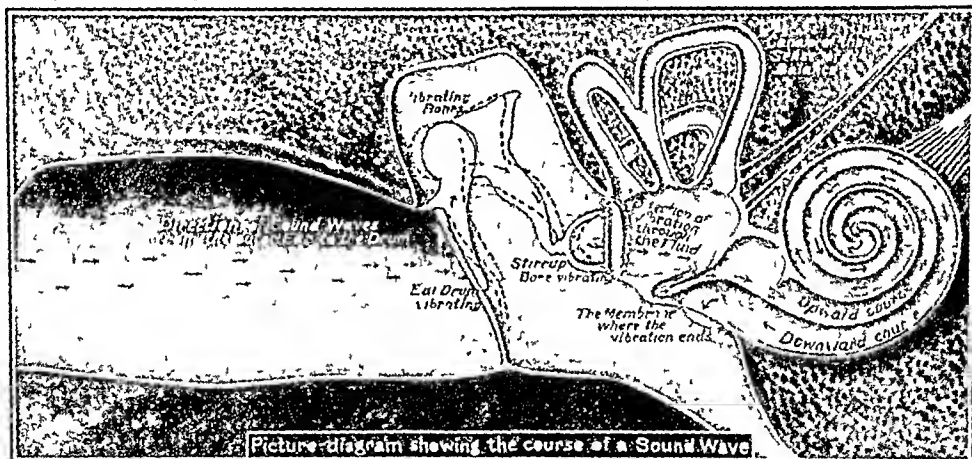




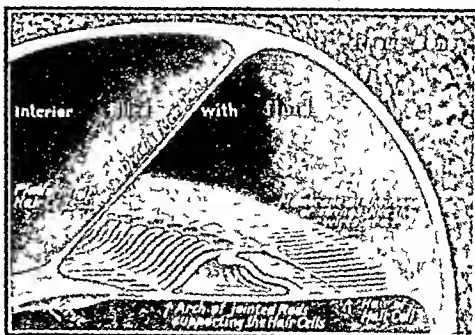
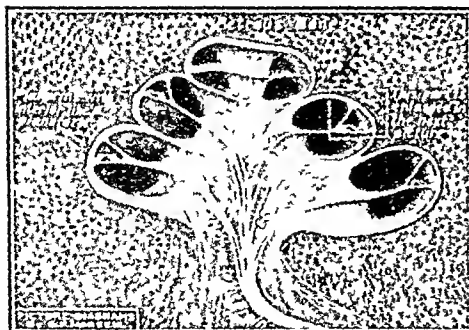
# THE WONDERFUL MACHINERY OF OUR EARS



This diagram shows the inside of our ear, from the entrance to the end of the nerve that passes to the brain. The drum is stretched across the end of the canal, and on the other side is the chamber of the middle ear, filled with air that enters from the throat. In this chamber are three small bones, the hammer, the anvil, and the stirrup, the last being fixed to the drum of the inner ear, which is shaped like the coils of a snail's shell.

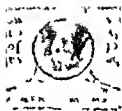


Here we see a sound-wave striking the drum of the ear. The vibration moves the handle of the hammer, which pulls the anvil and pushes the stirrup, as shown by dotted lines, against the drum of the inner ear. Tiny waves of the fluid inside this inner ear pass through a membrane which lines the shell, and, travelling round the coils in the direction of the arrows, communicates its sensation to the nerve, and then returns by another canal.



In this picture the spiral coil is cut through from top to bottom. The little galleries are filled with fluid, and contain very marvellous organs. The part in the dotted square is shown in the next picture enlarged.

Over 4,000 little hammers, jointed like those of a piano, support thousands of hair-cells that rest on a membrane. More than 10,000 strings are stretched across, like piano wires, and these convey the wave sensation to the nerve.



# THE MARVEL OF HEARING

This diagram shows how sound waves travel in all directions from a source. The waves are shown by the lines radiating from the bell. The lines are labeled with the letters A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, and the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.



The Child's Book of  
Its Own Life

which sense we begin with, for the great principles are the same in every case, only we may begin by noting the names of the various senses, and especially by distinguishing—as people usually do not—between the senses which communicate with the outer world and certain other senses which do not.

### THE SENSES BY WHICH WE KNOW THE OUTER WORLD

The senses which communicate with the outer world are—seeing, hearing, taste, smell, and touch. But nowadays we have learnt that it is not sufficient merely to say touch, for there are several senses in the skin besides mere touch. We must at least add the heat sense, the cold sense, and the pain sense to the sense of touch.

In addition to these senses which communicate directly with the outer world, there are other senses by which the brain is informed about the body. Of course, in a way, we may say that, so far as the brain itself is concerned, the body is part of its outer world. These senses come from the organs inside the body, from the muscles and joints, and from certain wonderful little canals in the inner ear, which we shall study later.

Now we can take the senses one by one, and we shall begin with hearing. We know that there is a special part of the brain concerned with hearing. If we were to use the word ear for the part of the body that really hears, we should certainly have to say that the real ear is in this part of the brain. The ordinary ear is on both sides of the brain, and the ear for music, as we say, is probably on the left side only in right-handed people, and on the right side only in left-handed people, though in great musicians the sensitive ear for music may perhaps be developed equally on both sides of the brain.

### THE REAL EAR IN OUR BRAIN THAT CANNOT HEAR AT ALL

But we are quite certain that sound cannot be heard directly by this real ear in our brain. The part of the brain where we feel touch feels nothing if it is itself touched, and this is true of the senses generally. The brain only responds if the communication is made to it through the proper channel. So what we now have to study is the channel that leads from the outside to the

hearing centre in the brain. Perhaps the best use of the word ear would be to describe the whole structure, from the surface of the body to the tiny nerve cells where the hearing is actually done.

If we begin at the surface of the body, we find in ourselves and in most of the higher animals a pair of organs projecting from the head, which are the only parts of the organs of hearing that we can see, and which we therefore call the ears, though they are by far the least important part of the whole organ of hearing, especially in ourselves. We have all observed a dog prick up its ears, and so we learn that the real use of the ear—or, as we should properly say, the outer ear—is to catch waves of sound.

It is the general rule that the outer ear is provided with small muscles by which it can be moved in various directions. This serves two purposes. First, it enables the animal to make the most of the sound that comes to it, for the sound-waves are, to a certain extent, gathered up by the outer ear, and so are made rather more intense.

### WHY ANIMALS PRICK UP THEIR EARS AT ANY SOUND

But the second great advantage of being able to move the outer ear is that it greatly helps to decide where a sound comes from. This is of great importance to such an animal as the antelope, which hears a sound and fears that it is the voice of a lion. We all have opportunities of observing how animals prick up their ears, and we can imagine them saying to themselves: "Wherever does that sound come from?"

It is very interesting to find in ourselves three little muscles attached to the outer ear, by which it ought to be pulled in various directions. These muscles exactly correspond with those that we find in the lower animals, but in ourselves they have quite fallen out of use. Though they are small, they are still quite capable of moving the ear; but we do not use them. A few people have the power of moving one or both outer ears at will, but there is no record of any human being who ever moved his outer ears when he was straining to hear a sound, or when he was trying to judge the direction of a sound.

We are able still to judge the direction of a sound, but we cannot do so anything like so well as the lower animals,



bone in the whole body. This is interesting because a hard bone must undoubtedly conduct waves of sound very much better than a softer one

#### THE LITTLE TUBE THAT RUNS FROM THE THROAT TO THE EAR

This middle ear is filled with air, and naturally we must ask where the air comes from; the answer is that it comes from the throat. There runs from the back of the throat on each side a little tube which goes to the middle ear and conveys air to it. If we shut the mouth and hold the nose, and then make a sharp movement as if we were sneezing we can feel something happening in our ears. This is because when we made that movement we opened the little tubes, and drove some air along them into the middle ears. It is a very important thing for the safety and health of the ear, and also for the immediate purposes of hearing, that the air-pressure on both sides of the drum of the ear should be the same.

If the air-pressure were greater on the outside than the inside of it, the drum of the ear would be driven inwards and strained. If any disturbance in the throat or nose closes up these canals, so that air cannot get along them, this is liable to happen. It is said that when we go quickly down the shaft of a coal-mine it is wise to make a swallowing movement a few times, because in swallowing we open the canals from the throat to the ear. The pressure of the outside air increases as we go down, and the drum of the ear is apt to be strained unless we open these little tubes and thus allow the air-pressure on both sides of the drum to remain the same.

#### WHY A COLD IN THE HEAD CAUSES DEAFNESS

Everyone knows that a cold in the head often causes deafness. The reason is that the cold, as we call it, spreads along the tubes that run to the ear. The lining of them becomes swelled up, and so they are closed, and cannot do their duty of keeping the air-pressure of the middle ear the same as the air-pressure outside. Hence the drum of the ear is strained and cannot vibrate as it should do to sound-waves, and so we are deaf for the time. In more serious troubles of the nose and throat, such as may happen in scarlet fever, the middle ear may be invaded by the

disease, and the drum of the ear may be broken through, and deafness for life is the result. It is probably quite fair to say that proper care and treatment from the first could prevent this very unfortunate result in every case.

But the most remarkable thing that we find in the middle ear is a little chain of three tiny bones, much the smallest bones in the body, which are there for a very special purpose. There is a picture of them on page 3866. They are called by Latin names, which mean the hammer, the anvil, and the stirrup, and the stirrup especially is exactly like its name. The handle of the hammer lies against the drum of the ear, the hammer is jointed to the anvil, and the anvil to the stirrup, and the foot of the stirrup lies against another sort of drum which leads to the most wonderful place of all—the inner ear.

#### HOW THE HAMMER, ANVIL, AND STIRRUP CARRY SOUNDS TO THE INNER EAR

The business of this chain of bones is to carry sound-waves across the middle ear. That is why it has to be filled with air, for otherwise they could not vibrate freely. Every time a sound-wave causes the drum of the ear to vibrate, it sets in motion the hammer bone which is fastened to it, and so the vibration goes on. If the joints between the bones become fixed, the hearing is spoilt in some degree. This may happen in old age.

Lastly, we find two muscles, very tiny but very useful, which pass into the middle ear. They have opposite uses, and we call them into action—though we know nothing about it—according to whether we want to hear a sound more acutely or less acutely. One of them is so arranged that when it pulls it tightens the drum of the ear. That makes the drum vibrate more energetically, and so we hear better. Whenever we strain to hear we throw this little muscle into action. It is called by doctors the *tensor tympani*, which simply means the stretcher of the drum.

The other muscle has just the opposite effect. It is attached to the stirrup bone in such a way that when it pulls the bone cannot vibrate as well as usual. So when this muscle is in action it interferes with the conduction of sound to the inner ear, and when a noise is unpleasantly loud we throw this muscle into action. It is noticed that in certain



end at the base of these cells. The fibres do not run into the cells, but the cells are, so to speak, perched upon the ends of the little nerve-fibres.

#### THE JOURNEY OF A SOUND FROM THE OUTSIDE WORLD TO THE BRAIN

Now we have actually traced the sound from the outer world to the ends of the nerve of hearing. We have seen the path of its conduction, sometimes along canals filled with air, sometimes along little bones, then along the canal of fluid, and, lastly, through their hairs into certain special cells made for the purpose. Here we come to a point which very few people understand, and as it applies equally to all the senses, we must know it thoroughly. We might suppose that the next thing to happen would be that the sound, having got so far, runs along the nerves of hearing to the brain. Nothing of the sort occurs.

Hitherto we have been dealing with things that are wonderful and complicated enough—so complicated that what has been said is only a mere outline of the facts—but at this point we have reached something compared with which all the rest is commonplace and simple.

The sound which reached the hair-cells of the inner ear does not pass along the nerves of hearing, but it sets up in them a nerve-current which runs to the brain. That nerve-current is not a sound-wave, it is utterly different in every way from a sound-wave. But it is that current, and that alone, which excites the hearing cells in the brain, and enables us to say that we hear.

If we examine the nerve of hearing through a powerful microscope, it looks just like any other nerve. But to say merely that it is capable of carrying a nerve-current which we translate into sound is not to state half the mystery, for we must consider the infinite variety of sounds that we can hear and distinguish.

#### THE MANY NERVE CURRENTS THAT PASS TO THE BRAIN WHEN WE HEAR MUSIC

What must be the number and delicacy and variety of the nerve-currents passing along these nerves of hearing when a great musician conducts a big orchestra, and can hear every instrument separately, and know whether it is in tune or not? How delicate must be the varieties of current that are possible when we remember that it is scarcely possible for us to mistake the voice of

one friend for that of another, and that, after twenty years, hearing a mere syllable pronounced will tell us that someone is present whom we have not seen for all that time!

So long as we confine ourselves to the study of the inner ear, and see the tens of thousands of fibres of different lengths, and the hundreds of thousands of hair-cells which it contains, we are not so much puzzled, because here is something which seems fitted to correspond with the powers of the sense of hearing.

There ought to be the power of noticing slight differences in sounds by means of an organ so complicated as the inner ear is. But the inner ear would not be of the least use without the nerve of hearing, and every one of these tiny differences in sounds means a tiny difference in the something that runs along the simple little white threads that serve to make up this nerve.

#### THE GREAT MARVEL OF NERVE-CURRENTS THAT VERY FEW PEOPLE THINK ABOUT

Language cannot say how wonderful these things appear to those who really think about them, and it is a great pity that so many of us should go through the world, hearing, seeing, and moving, and yet never giving a thought to these marvels upon which our lives depend.

The fact that nerve-currents, and not sound-currents, travel along the nerve of hearing is a general truth of all the senses. It is not light that travels along the nerve of vision. The place in the brain where we see is enveloped, and lives always in utter darkness, no light ever reaches it. What reaches it is the nerve-currents from the nerves of vision. All that the light does in entering our eyes is to do something which starts those nerve-currents in the ends of the nerve of vision.

And all that sound does in entering our ears is to start certain nerve-currents in the ends of the nerve of hearing. When we study the variety of sensations that are possible for us, we see that a nerve-current, though we talk about it so easily, must be nearly the most complicated and wonderful thing in the world, compared with which the waves of sound or light, or electricity, must be considered quite simple.

The next part of this is on page 3953



**PERSIA AND ASIATIC TURKEY**  
THE LANDS OF THE SULTAN AND THE SHAH

We already have  
 some idea of  
 the richness of Asia  
 the land content  
 four times the size of Europe  
 for in the story of India we  
 have reached the majestic  
 Himalayas which form the  
 pink top all the other white  
 capped giants of the world  
 in the store of luxury we  
 have in the storm Cas-  
 pian the great land and water world  
 We have felt the different  
 climate in the world as we travel in  
 imagination by the Orient Express  
 to the world famous rail road



The Holy Spirit  
 At a Sunday School  
 of Arab children  
 You drew a stick  
 which said it was a  
 cross that England  
 When I saw that it  
 did not belong to  
 the world at all  
 about the cross  
 may be the cause

who travel in Asia is that the great  
of the past is a part of the present  
of the future. We are not a nation of  
the past, we are a nation of the future.

[illegible]

*(Faint, illegible handwritten notes)*

The new manuscript covers the last  
 part of the century, and I like the  
 German handwriting. The first part  
 contains the first part of the century  
 and the second part the second part  
 of the century. The manuscript is  
 written in a very good hand, and  
 the ink is very dark. The paper is  
 very old, and the binding is very  
 good. The manuscript is very  
 interesting, and I like it very  
 much.



spread all over the wide world. Abraham's country received yet another name in after years—the Holy Land, for here, some twenty-four centuries after Abraham slept in his ever-shifting tent under the brilliant, starlit sky, Christianity was founded in the great days of the Roman Empire. Here was born, and lived, and laboured and here died, Jesus Christ, and for nearly 2,000 years pilgrims have visited, with deep interest and devotion, the scenes of His early and lowly life at Bethlehem, at Nazareth, at Jerusalem, and other places.

#### **SOUTH-WESTERN ASIA, WHICH WAS THE CRADLE OF TWO GREAT RELIGIONS**

His disciples carried His teaching through some of the provinces of Asia Minor and round its Mediterranean coasts, where the wavy shores and countless islands have just the same soft beauty as those of Greece across the Archipelago. From Greece the religion of Christ spread to Rome; from thence over the world; and, in the chapters of the Bible, men of all races have become familiar with the various features of Palestine, with the desolate salt lake known as the Dead Sea—over 1,000 feet below the level of the Mediterranean—the River Jordan, and the shimmering Lake of Galilee among the hills.

The third of the great world religions that have sprung from South-western Asia arose about 600 years after Christ, from Arabia, when Mohammed, the camel-driver, a man of immense personal power and enthusiasm, announced his message. "There is but one God, and Mohammed is His prophet." His teaching soon spread far and near, and South-western Asia has remained ever since so much the heart and centre of Mohammedanism that the history of its countries is closely bound up with the history of the progress of that religion.

#### **THE NARROW CHANNEL THAT SEPARATES EUROPE FROM ASIA**

But before going into that history, let us take a rapid glance over the surface of the lands that are so interesting to lovers of ancient life, and to Jews, Christians, and Mohammedans alike.

Shall we start from Constantinople, the capital of the Turkish Empire, in which Europe and Asia meet? As we know, it is but a short ferry across the Bosphorus to its Asiatic suburb of

Scutari, which stands on the same rocky mass as Stamboul in Europe, with but a narrow cut between, by which the waters of the Black Sea pass to the Mediterranean.

If we could sweep over this part of the country in a flying machine, we should see that the ridges of mountains encircling the central plateau of Asia Minor have many points in common with the mountains of the Balkan peninsula, the mountains which caused so much isolation in former days. Let us note the deep, marshy plains near the blue sea, separated by shaggy mountains, the rivers running in deep gorges in the uplands—like those of Spain—where a brown dryness spreads over the earth. In other parts we see smiling and fertile valleys, rolling, grassy highlands topped by bare, rocky peaks.

It is said that there is not a spot of ground in this peninsula of Asia Minor that does not contain some relic of the stirring events which have swept over it for thirty centuries. For it has been not only the battlefield of powerful nations, but the home of the beautiful arts of peace and culture, which crossed over from Greece by the stepping-stones of the lovely islands of the Archipelago.

#### **THE GREAT SALT DESERTS OF PERSIA WHERE NOTHING WILL GROW**

The highlands of this western peninsula stretch onwards and southwards to the beautiful forest-clad mountains of Lebanon in Syria, and eastwards to the high plateau of Armenia, connected with the Caucasus range. Skirting the base of the Caspian, the highlands spread over the greater part of Persia, sinking southwards into the Indian Ocean, and rising in the east to the highest mass of land in the whole world.

A rich tract of land lies round the south of the Caspian Sea, shut in by the Elburz range, and some other parts of Persia are very fertile too. But the greater part of the country consists of high and dreary plateaus and deserts, in the east these tracts are full of salt, where nothing will grow.

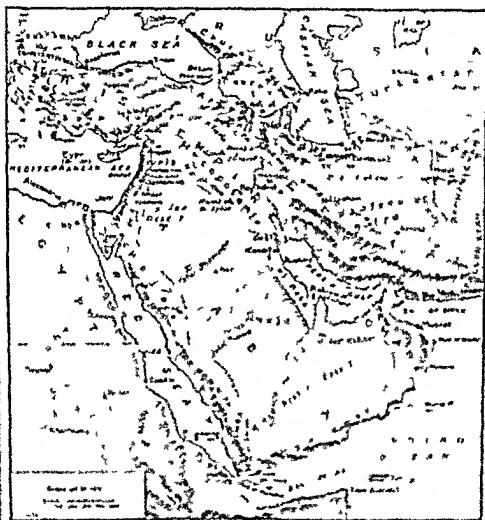
Mesopotamia, the land of the two great rivers, separates the highlands of Persia, or Iran, as its inhabitants call it, from those of the immense southern peninsula of Arabia. To-day, Mesopotamia is chiefly a dry and dreary country, with very few people living in

# PERSIA AND ASIATIC TURKEY

it an its field beyond the river banks are little cultivated. In Atrahuris time and earlier and later too there were thousands of people living in great cities whose grassy mounds now dot the desolate landscape. Others worked in the rich green field and orchards and farms watered by a wonderful system of canals and ditches and other channels.

till and as with a well stretched of grass where flocks and herds find pasture and here and there are cultivated patches of fruit where water can be obtained.

In the deserts of the north the vegetation and animal life can exist. The yellow and red of the desert only extends to the edge of the



Map of Persia and Asiatic Turkey showing the Tigris and Euphrates rivers, the Persian Gulf, and the surrounding regions. The map includes labels for various cities and geographical features, as well as a legend in the bottom left corner.

thirsty soil has enough to drink Coffee-gardens, date-groves, cinnamon-trees, and other spices all flourish on the edge of Arabia. An old writer even speaks of the sailors out at sea enjoying the odours of the sweet spices wafted to them from these luxuriant coasts.

#### CARAVANS OF PILGRIMS THAT CROSS THE DESERTS TO THE PROPHET'S SHRINE

We have spoken of the Christian pilgrims who visit the Syrian Holy Land. These are few and far between, compared with the numbers of Mohammedan pilgrims who visit their Holy Land of Arabia. Every good Mohammedan hopes to visit Mecca and Medina, the birth-place and burial-place of the Prophet before he dies, and the desert routes are crossed by caravans of camels, from oasis to oasis, from Baghdad on the Tigris, from the Persian Gulf, from Damascus, bringing pilgrims from India, Persia, Central Asia, and far-spreading Turkey. Those from Egypt cross the Red Sea to Jiddah, the port of Mecca.

For centuries before the birth of Mohammed at Mecca, this town had been looked upon as a holy spot; and its temple—the kaaba, with its famous black stone—was a place of pilgrimage for tribes and peoples of varying beliefs who lived in Arabia and beyond. The wildest of these tribes wandered about the sun-baked interior, as they do to-day, seeking pasturage for their flocks and herds, the more civilised ones were partly settled in the fertile spots, tilling the ground and farming.

One of the first objects in the Prophet's life, after persuading his own family of his great mission, was to get his countrymen to give up the idolatry that was carried on at the kaaba, and to worship only one God. Of this we read on page 300.

#### HOW THE PROPHET OF ARABIA FLED FROM HOME TO SAVE HIS LIFE

He also tried to persuade them to sink differences and to unite as one nation. As is the case with all reformers, Mohammed had to face much opposition and great dangers. He had to flee from Mecca to Medina, on an oasis further north, to save his life. This is called the Hegira, or Flight, and it happened in 622. His followers all over the world date their years from the Hegira, as we Christians date our calendar from the birth of Christ.

Mohammed died eleven years after the Hegira, without naming a successor, and he left no son. The first three caliphs, or successors, were his father-in-law, Abu Bekr, his friend, Omar, and his son-in-law, Othman.

The fourth caliph was Ali, cousin as well as son-in-law of the Prophet. Many who held that Ali ought to have been the immediate successor of Mohammed looked upon the first three caliphs as usurpers. From early days Mohammedans split into two great sects on this difference, and bitter feelings were rendered still more bitter by the murder of Ali's son, Hossein, on the banks of the Euphrates.

The teaching and the conquests that Mohammed began, spread with most amazing rapidity under these first caliphs. "During the reign of Omar," says an old writer, "the Arabs conquered 36,000 cities, towns, and castles, destroyed 4,000 Christian and other temples, and built 1,400 mosques."

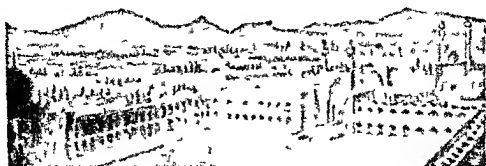
#### THE FIERCE MOSLEM CONQUERORS WHO BROUGHT FIRE AND SWORD TO EUROPE

Nothing stopped the enthusiasm with which they sought battle and danger. Syria fell to their arms, and the provinces of Asia Minor were all won from the decaying Eastern Empire. The fire of conquest spread into Egypt, thence along the north coast of Africa, and across the Straits by the Pillars of Hercules into Spain and to France. Eastwards the blazing power of Mohammedanism spread across the country of the two great rivers into Persia.

We have read of the long wars between the Greek emperor and the Persians, and of the story of the piece of the true Cross, and of how Shu'een, the Christian wife of the sun-worshipping Persian king, had to give it up. In the course of these wars the Persians gained from the Eastern emperor all the lands that had been won through the centuries by the Romans, and the Persian king, who had marched victoriously from the Euphrates to the Bosphorus, called himself the "Asylum of the Universe."

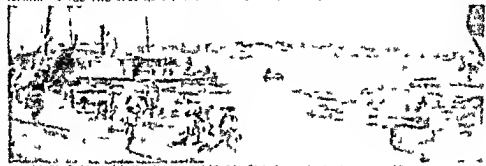
In the year that Mohammed made his famous flight from Mecca, the "Asylum of the Universe" stood on the Bosphorus with just a mile of water between him and Constantinople. The heroism and genius of the Emperor

# SOME FAMOUS CITIES OF THE NEAR EAST



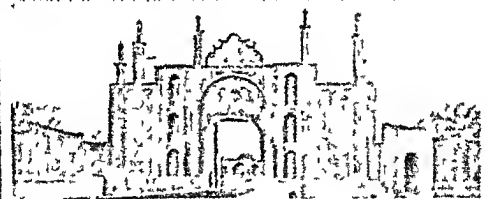
ISRAEL AND THE SPLENDOR OF THE CITY

BY A. A. A.



A FINE VIEW OF THE CITY OF JERUSALEM

12



THE GREAT CHURCH OF THE HOLY SEPULCHRE

13



THE TEMPLE OF THE HOLY SEPULCHRE, A VIEW FROM THE WEST

THE TEMPLE OF THE HOLY SEPULCHRE, A VIEW FROM THE WEST

Herachus turned the scale and saved the capital and empire, and Chosroes II had to retire to his own country and be content with its limits and his grand palaces, adorned with the spoils of the treasure-houses of many nations.

Suddenly, in a most tragic way, the splendour of the great king came to a miserable end, for only a few years after the torch had been lighted by the Prophet, his successors, burning with zeal, turned their arms against Persia, and shattered the hosts arrayed against them, despite the desperate valour of the Persians and the heavy charges of the lines of elephants.

The Mohammedans crushed the old fire-worship of the Persians. Some few of the old faith remained steadfast in their own country, and many fled to India, where their descendants to this day are known as Parsees, or Persians. Thus, Persia—that most ancient kingdom—passed under Arab rule, though often, during the eight centuries that followed, the governors of different provinces were practically independent.

#### THE SPLENDOUR OF THE CALIPHS AND THE GREAT LEARNING OF THEIR PEOPLE

The caliphs who ruled over South-western Asia shifted their capitals from time to time, and we catch glimpses of the splendour of their courts at Damascus, in Syria and Baghdad, on the Tigris. It is at the latter place that we meet the Caliph Harun al Rashid, surnamed the Just the Upright, the Great. He was the friend of Charlemagne, and the hero of many of the stories of the Arabian Nights. He twice crossed the mountains of Asia Minor and looked from the heights of Scutari on Constantinople. He was a great patron of the arts and of the learning for which the Arabs became so famous. It is to them we owe the figures we use in place of the more cumbersome Roman numerals; it is said they first found out how to make paper and gunpowder and how to use the compass. Their researches in mathematics and astronomy paved the way for all future study, and the traces of their wonderful architecture and skill in decoration are still a delight wherever we find them, from Persia to Spain.

About the time when the Normans were intent on conquering England, a race called the Seljouk Turks made

their way from the East. They early became Mohammedans, and overthrew various states in Persia, conquered Armenia and Georgia, and overran Asia Minor and the surrounding territories.

#### HOW THE CALIPH OF BAGHDAD GAVE HIS POWER TO THE TURKISH LEADER

It was in 1055 that a dramatic scene took place in Baghdad, when the Caliph Kaim, to escape further troubles, put himself under the protection of the leader of the Seljouk Turks, and gave up to him the temporal power of the caliphs. The Seljouk kissed the dust before the caliph, then ascended the throne and received the two crowns of Persia and Arabia. Many mosques and colleges rose up in Baghdad, new roads and canals were made, and the boundaries were extended in all directions.

It was the action of these Seljouk Turks on the Christian pilgrim routes through Asia Minor and in the great centre of Jerusalem that inflamed Western Europe to start on the famous Crusades. Arabs and Turks united against the Christians, and much terrible fanaticism was aroused. The hero of the Mohammedans in these long wars was Saladin, famous for his courage, his justice, and his fidelity to his plighted word. On the Christian side there rise before us the forms of the lion-hearted Richard, the German Frederick of the Red Beard, who was drowned off Asia Minor, the Prince of Wales, after-Edward I, struck by the poisoned dagger, and his gallant wife Eleanor.

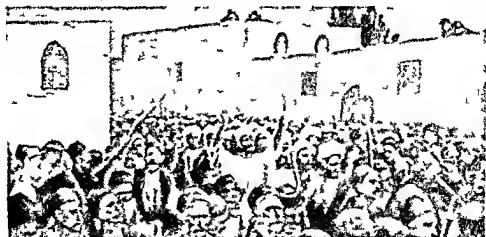
Barely two centuries after the rise of the Seljouk Turks a fresh wave of conquerors swept from the unknown East over Persia and the rest of South-western Asia. These were the Mongols, under their leader, Genghis Khan. Province after province fell before them. Baghdad was captured and destroyed, and the valuable library of the caliphs burned.

#### THE COMING OF THE TARTARS AND THE FURY OF THEIR CONQUEST

Western Asia became more and more desolate under the fierce and bitter struggles of the various parties seeking power, and in 1387 a fresh horde of Mongolian Tartars poured over the whole country in a perfect storm of conquest, under Taimur, or Tamerlane.

A new race of Turks called Osmanli, or Ottomans, after their first independent leader, Osman, or Othman, had

# THE PEOPLE OF PERSIA AND ARABIA



A vast and interested crowd of Persians to meet the Shah of Persia at the entrance to the city and a consultation. The Shah, seated on a throne, is surrounded by his courtiers and attendants.



A group of Persians. A group of Arabs. A group of Persians. A group of Persians. A group of Persians. A group of Persians.



The Persians of the city. The Persians of the city. The Persians of the city. The Persians of the city. The Persians of the city. The Persians of the city.

Turkish pushers, or governor, have been quite incapable of dealing with the different tribes of northern Mesopotamia, the Kurds, the Armenians, and Arabs. Little by little, and into permanent under-standings, they have been able to bring the tribes into a state of peace, which was the first step to the work of civilization. The first step was the old Arab tribes, who had been the most lawless and the most cruel of the tribes of the desert. They had been the most lawless and the most cruel of the tribes of the desert. They had been the most lawless and the most cruel of the tribes of the desert.

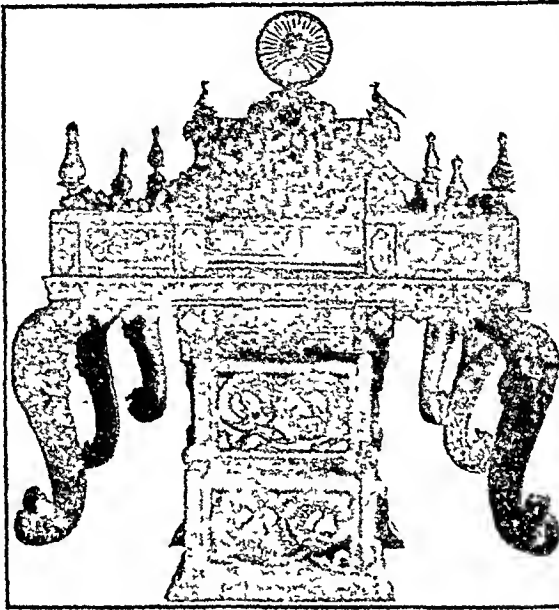
We have, perhaps, a general idea of the strong contrasts of Persia, of the wide-spread deserts, crissed by caravans, wearing silks and carpets, date and embroidered to the porte on the Caucasus and Black sea; of the hard, parched, or dewy; of the fast, or slow for us. We are wont to see everything done to meet the people, not on hand and as far as we can have to satisfy different forms is from antiquity, as seen in the West. Each one of being, suitable, for there are a great many of them, and they are





Persia is one of the countries now struggling for a constitution. One was granted to them in 1906, signed by the Shah and his son, but it was of little use to the bulk of the people, and fresh attempts to win freedom have plunged Persia into civil war and great difficulties which are not yet settled. Turkey, as we know, has unexpectedly, and in most dramatic fashion, accomplished its revolution in two stages, and, as we cast our eye over its wide dominions in Western Asia, we can imagine the work that lies before the reformers to teach the people of so many different races, long crushed under

despotism, the responsibilities as well as the blessings of having a voice in the government of their country.



THE PEACOCK THRONE OF THE SHAHS OF PERSIA

Travel in Turkey in Asia is not much easier yet than in Persia, though there is a railway from Scutari into the heart of Asia Minor, and it is hoped that in time this railway may be continued by way of the Euphrates Valley to the Persian Gulf. But the difficulties are immense. There are also some short lines in Syria and a line from Damascus to Medina and Mecca, to help on their way the thousands of pilgrims who still continue to visit the holy cities of Mohammedanism.



PERSIAN REBELS DISCUSSING PLACE TERMS WITH THE REPRESENTATIVES OF THE SHAH. During the civil war in Persia for a constitution and a parliament, the British consul at Tabriz arranged a meeting between the rebel leaders and the representatives of the Shah. Here we see the delegates seated upon a rich Turkish carpet with no other furniture in the room, smoking their hookahs, or Eastern pipes.

THE NEXT STORY OF COUNTRIES IS ON PAGE 2011



THE HEROIC COUNTESS

# THE BOY WHO SAVED A CREW

IN the year 1798, during a terrific storm, a French ship, *La Tribune*, was wrecked one evening off Halifax, Nova Scotia, and a number of men belonging to the crew managed to climb into the rigging, where they remained all night, the people on shore being powerless to assist them in the raging tempest.

When daylight dawned, the poor men were still in the rigging, almost exhausted by their terrible experiences of the night. The sea, however, was still rising in angry waves, and beating like a torrent upon the wreckage and the shore, so that none of the strong men on the beach dare venture out to rescue the shipwrecked mariners.

It was then that a deed of amazing courage and splendid heroism was performed by a boy, only thirteen years of age, whose name, unfortunately, has not been preserved to us. This lad had been watching the wreck for hours, and listening to the talk of the spectators, expecting that some of the latter would at any rate make an effort to save the wrecked sailors. When at last he found that no one dared to make the attempt,

he determined to see what he himself could do to reach the stranded vessel.

Jumping into a small boat, the boy rowed with all his might for the wreck, and although the wind and the waves were almost too strong for him, he managed at last to reach the ship, and get his little boat near enough to take off two of the men. They were too exhausted to assist in rowing to the shore, but the plucky boy, by great exertions, landed them safely.

Then he started for the wreck once more, but his strength was exhausted and he was unable to battle with the wind and waves, and had to return to the shore, to his intense grief and disappointment.

The brave example set by so young a lad, however, bore good fruit, for the men were shamed into making an effort themselves, and several boats went out to the wreck, and were successful in finally saving the whole of the men who had taken refuge in the rigging. But the credit for the rescue belongs to the unknown boy, who may truly be said to have saved the crew from death.

## A BRAVE ROMAN YOUTH

Soon after the brave Horatius held the bridge against the Etruscans, Porsena, their king, defeated in his attempt to capture Rome, encamped with his army on the banks of the Tiber to watch his opportunity.

Now, there was a noble Roman youth named Caius Mucius, who was greatly distressed at the state of hunger to which his fellow-citizens were reduced, and so he plotted, with other young men, to free his country from the foreign invaders. Taking a dagger with him, he went to seek out King Porsena, with the intention of killing him.

But when he arrived at the place where the Etruscan king was wont to sit in judgment, he found the soldiers receiving their pay from a man whom he imagined to be the king, but who was really the king's secretary. Without hesitation, Caius Mucius unsheathed his dagger and stabbed him to the heart. Immediately the youth was surrounded by the guards and dragged into the presence of King Porsena, who angrily ordered him to be burned if he did not

instantly confess the whole thing. But Caius Mucius stood dauntlessly erect, and refused to betray his plot.

"See," said he, "how little your tortures can avail to make a brave man tell the secrets committed to him." And, thrusting his right hand into a fire burning near, he held it there without shrinking.

King Porsena, astonished at such fortitude, and admiring his patriotism, told the guards to spare the youth and see him safely out of the Etruscan camp.

"You are a brave man," he said, "but you have hurt yourself more than me."

Caius Mucius, moved to gratitude at such clemency, then told the king that his generosity had conquered where his threats had failed, and that three hundred youths had taken an oath to kill him, and he, Caius Mucius, had been chosen to make the first attempt.

So the Roman youth was released, but ever after he bore the name of *Scævola*, which means "left-handed," because his right hand was useless.

The next Golden Deeds are on page 409.



A WALK IN A COUNTRY LANE



But I must tell you about Queen Eleanor's Walk. It is a green lane, but there are tracks on either side made by waggon-wheels, and the middle is rather rough walking because of the deep cuts made in wet weather by horses' feet. Once, when we first came upon this lane, I asked the three little girls how they knew carts passed that way, and, very surprised at my asking such a foolish question, they pointed to the ruts and the marks of the horses' feet. But I said: "Suppose that there were no marks on the grass, how could you tell then?"

There was a pause, and the three little pairs of eyes looked here, there, but not everywhere, and were just about to give it up, when one of the three little tongues cried out: "I know!" and a tiny finger pointed to the branches overhead. These branches had caught and kept from the passing waggons stalks of yellow corn.

The branches in Queen Eleanor's Walk are a great joy to us for many reasons. They grow very thickly on either side, and curve at the top till they form a roof, which makes the walk cool and deepens the greenness of the grass.

#### THE QUAIN AND INTERESTING THINGS THAT ARE FOUND IN THE TREES

Then you will find the queerest coloured little flies, with spots on their backs, occupying a twig, and in the fork of a bough a mossy bird's-nest hidden by bunched leaves, and lying along a branch, so exactly like it that even birds in the trees do not observe it, a caterpillar, and you will often see an ant tearing along a branch with all the speed and fuss of an old gentleman running to catch his train, and perhaps a baby spider—there are many wonderful and even beautiful spiders in the lane—going on a voyage of exploration.

Now, our three little girls are too young to know all about the real names of these things, and not quite patient enough just yet to learn every curious thing there is to learn about their habits. But they love watching these things, and I will tell you how they think about them. They think of them as people with homes of their own, who have fathers and mothers, and brothers and sisters, and must work for their living or die of starvation. They say of a tiny spider "I expect he's a boy, and

he's going to see if he can't surprise his mother by bringing her home something nice to eat." And of the caterpillar: "I dare say he's thinking where he will go for the holidays when he wakes up a butterfly." And of the little green and speckled grey flies: "I expect they're rather frightened when the night comes if their mothers and fathers have been eaten by the birds."

#### THE BEAUTIFUL WILD FLOWERS THAT GROW IN THE GREEN LANE

Our three little girls talk in something of the same way of the beautiful wild flowers which grow in the thick grass of the banks on either side of this dim green lane. But they know most of their names, particularly the pink and white campions, cow's parsley, buttercups, celandines, stitchwort, blue bells, and scabious.

They talk of the mystery of these things. How is it that one flower is blue and another is yellow, seeing that they grow in the same soil, and feed on the same sun and the same air? What is colour? What is scent? Why does one flower give scent, and not another? They are very quick to point out the smallest difference in the shape of the petals and even the shape of the stalks. "I wonder if they mind being picked, and carried home to live in a vase full of water?" they say. Sometimes they dig out a whole root, and take it back to plant in their garden, and when a friend calls and sees the flower, they say: "We took the dear little thing out of Queen Eleanor's Walk, and it's quite happy here, because we water it morning and evening, and it's got more room to grow, and it's ever so much bigger and stronger now."

But I have saved the chief joy of Queen Eleanor's Walk to the last. There is a little wood on one side, and a board says "Trespassers will be Prosecuted," because it is full of pheasants and other creatures.

#### THE FLUTTERING OF THE LITTLE BIRDS IN AND OUT OF THE HEDGE

But the pheasants very often lie in the hedges, and our three little girls, who have trained their eyes to see almost everything, will soon pick out the gorgeous plumage of these crouching birds, and stand quite still, and quite close, watching them. They



# THE SIMPLE BEAUTY OF A QUIET LANE



The poet tells us that "God made the country and man made the town," and though we may see the roadman actually at work in a quiet country lane, the beauty and calm make us feel the truth of the poet's sentiment



Our British country lanes have a beauty all their own Flanked everywhere by magnificent trees, nodding beeches, rugged elms, massive oaks, and tall, waving poplars, they present a scene like a picture from paradise

# A PARADISE OF LIFE AND COLOUR



The life in your own country house may not have the interesting variety of life in the garden of the house, but let a stone be dropped on to the path and you will see the life in the garden.



It is not the life in the garden of the house, but the life in the garden of the house, that is the life in the garden of the house.

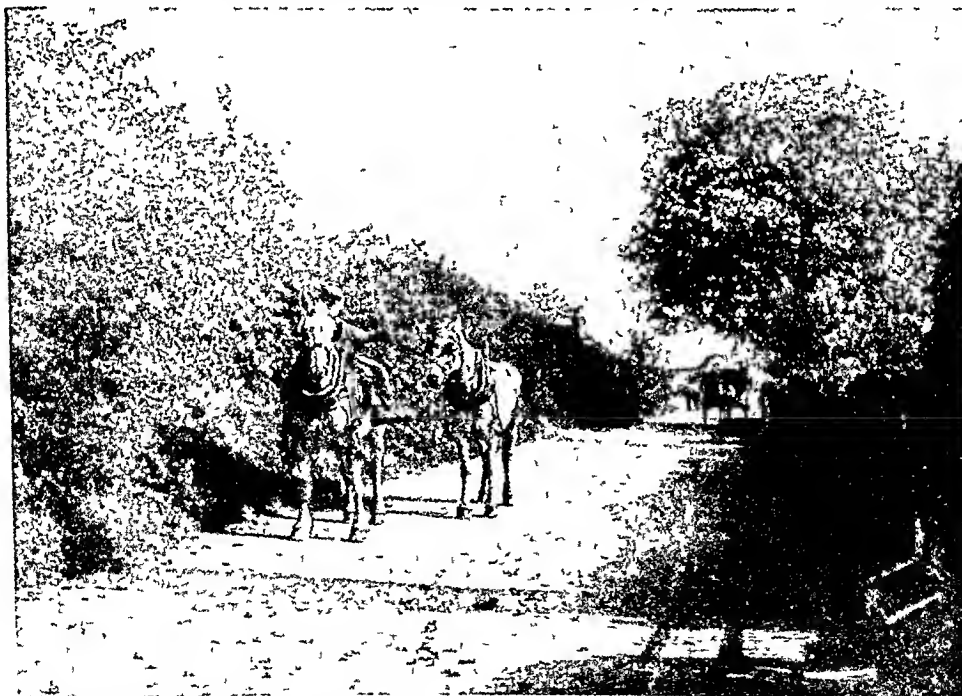
The life in the garden of the house is the life in the garden of the house, that is the life in the garden of the house.



# GLIMPSSES OF LIFE IN THE COUNTRY-SIDE



Everywhere in the country some picturesque sight greets us, like the farm and the pigeon-house in this picture. Formerly only the owners of manors were allowed to build dovecots or pigeon-houses on their property



When "the ploughman homeward plods his weary way" it is usually with his horses, and the scene in this picture is a familiar one in any country lane in autumn, when the harvest is over and ploughing has begun

The photographs on these pages are by Percy Collias W Reid R W Copelman and others

# SHADY NOOKS BY THE SIDE OF THE LANE



Every been and there by the side of the lane we find a do place spot lit. It is not a very big one, but it is a pleasant place to sit and rest. There is a perfect pleasure in reaching after it, and that is the reason why we go to it.



A heavy mass of trees is a fact. There is a very large tree in the center of the group, and it is very old. The path is very narrow, and it is very difficult to find. The trees are very old, and they are very large. The path is very narrow, and it is very difficult to find. The trees are very old, and they are very large.

# PEEPS OF THE FIELDS FROM THE LANE



Not only in the lane itself is there much to interest and delight us, but as we look over the bank or through the hedge, we see sights like this. Pigs in clover are always happy, although they cannot be described as pretty.



Perhaps we may see a horse with its foal. And, surely, of all the pretty sights to be seen over the hedge, none is quainter than this! The foal seems so very funny with its long legs out of all proportion to its body.

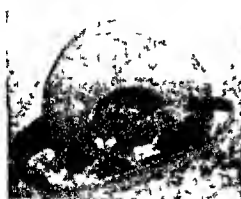
# FAMILIAR SIGHTS IN A COUNTRY WALK



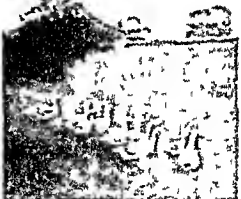
Golden and silver dandelions are familiar sights in every country. The flowers are yellow and the seeds black.



The peacock butterfly is a familiar sight in every country. Its wings are black and white with blue and red markings.



The rocks are often found in every country. They are of various shapes and sizes.



There are many different kinds of rocks in every country. They are often found in the same place.



Many different kinds of bushes and shrubs are found in every country. They are often found in the same place.

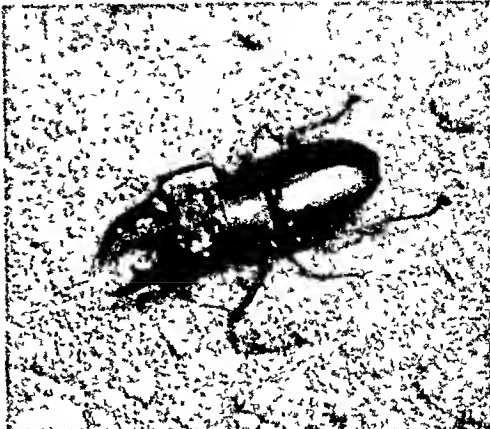


There are many different kinds of bushes and shrubs in every country. They are often found in the same place.

# COMMON OBJECTS OF THE COUNTRY-SIDE



The common tiger-moth, shown here, is one of the most strikingly coloured of our moths, and the crimson of its hind-wings gives a fine flash of colour as it flies past.



The male stag-beetle, with his great horn-like jaws, is not so fierce as he looks. He flies and walks rather slowly, and is usually to be seen at evening time.



The squirrel is a most active little creature. He never seems still a moment, and we may often see him leaping from tree to tree, taking the hazel or beech nuts.



The little wryneck looks a dull drab at a distance as he hops from twig to twig, but a closer view shows that he is beautifully marked to imitate the bark of trees.



The blackbird builds her nest of twigs and grass mixed with mud, in the hedge. There she lays four or five eggs, and any time from March to July we may see the familiar objects, bluish green in colour, spotted with brown.



We can tell a stoat from a weasel by his larger size and duller brown colour. The underneath part, too, is yellow instead of white. That is his summer dress as seen here, but in winter he changes into a white coat.

# THE NATURAL HISTORY OF THE HEDGEROW



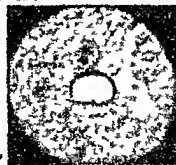
The deadly nightshade is to be seen in our hedges but it is a berry where we are first to see it a berry is black berries must be pressed for they are dark looking only with the berries and are to be seen in our hedges. One berry has been known to kill a person, all we find it is but a small seed in the hedge.



The berries of the deadly nightshade are very poisonous and are to be seen in our hedges. One berry has been known to kill a person, all we find it is but a small seed in the hedge.

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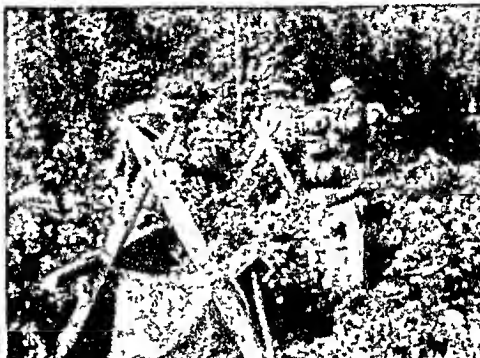
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# IN THE FAMILIAR HOP GARDENS OF KENT



Kent produces more than half the hops grown in this country, and almost wherever we walk in the Kentish lanes we see the hop fields on the right hand and on the left. The young hops are now usually trained upon wires.



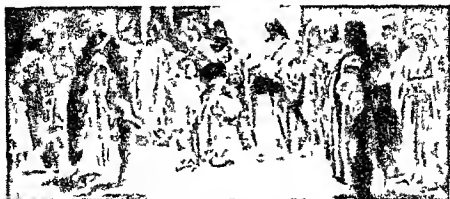
When the hops are ripe, armies of pickers go out, and in a short time strip the fields bare. Here we see the pickers at work. Each hop is picked singly, and no leaves may be thrown into the cribs, or bins.



In this picture we see a hop garden with the fine, healthy hops ready for picking. It is not unusual for a single acre to produce a ton of hops, but the price realised varies between two pounds and twenty pounds.

THE NEXT PICTURES OF FAMILIAR THINGS ARE ON PAGE 3997

BIBLE STORIES  
The Life of Jesus



Jesus took the little children up in his arms, and putting his hands upon them, blessed them.

STORIES FROM THE GOSPELS  
THE BIRTH AND BOYHOOD OF JESUS



them "Suffer the little children to come unto Me, and forbid them not for of such is the Kingdom of God. Verily I say unto you, Whosoever shall not receive the Kingdom of God as a little child, he shall not enter therein." And after this sublime rebuke and this profound lesson, the Master took those little children up into His arms, put His hands upon them, and blessed them.

For the Pharisees He had had only explanation, for the curious multitude only teaching, for the puzzled, questioning disciples only instruction; for the children He had blessing. Thus do we learn that to lay down doctrines and dogmas concerning this and that in

Christ's mission, or to look too narrowly into the Bible for reasons and arguments, is to miss the secret. For such people there may be answer and instruction, but never blessing.

"Verily," and that means *emphatically*, "I say unto you, Whosoever shall not receive the Kingdom of God as a little child, he shall not enter therein."

The secret is so simple and so beautiful; God is love. To enter His Kingdom one thing alone is necessary—love, the simple, unquestioning, and adoring love of a little child.

Of all the events in Christ's life, this simple and almost accidental event reveals in a master-stroke of extraordinary beauty the religion of Christianity.

## THE COMING OF THE RICH YOUNG RULER

It was soon after the incident we have just narrated that another striking event occurred in the life of Jesus. He was walking with His disciples when a young man came running after Him, and, reaching the place where He was, kneeled before Him in admiration and reverence.

"Good Master," exclaimed this youth, who, unlike Christ's disciples, was of the higher classes, "what shall I do that I may inherit eternal life?" The question meant "I have heard Your teaching, I know that You speak of a life which is everlasting, I want to satisfy the unrest which is in my soul, tell me what is necessary for me to do."

While the disciples looked with interest at the fervent youth kneeling before their humble Master, Jesus uttered one of His most memorable sayings "Why callest thou Me good?" He said gently; "there is none good but One, that is, God." Then He made a statement of the laws, the laws which concern morality, and the young man replied "Master, all these have I observed from my youth."

Whether he said this sadly, as though the keeping of commandments had not satisfied his longings, or whether he said it modestly and yet with pleasure at the remembrance of his victory over evil, Jesus, we are told by St Mark, "beholding him, loved him."

Very tenderly the Master must have said to him what followed: "One thing thou lackest go thy way, sell

whatsoever thou hast, and give to the poor, and thou shalt have treasure in heaven: and come, take up the cross, and follow Me."

Did the young enthusiast make any answer to this invitation, any answer to the glance of love? It is not written. All we read are the painful, sad, but natural words: "And he was sad at that saying, and went away grieved: for he had great possessions."

Can we not picture the expression in the eyes of our Master as He watched the slow, retreating figure of the young man? No word of recall was uttered. Jesus watched him go, then He turned and, looking round the little group of His disciples, said, "How hardly shall they that have riches enter into the Kingdom of God!" That beautiful saying, so simple and so true, puzzled the disciples.

"Children," Jesus said to them, "how hard is it for them that trust in riches to enter into the Kingdom of God! It is easier for a camel to go through the eye of a needle than for a rich man to enter into the Kingdom of God." That is to say, a man attached to wealth and power cannot possibly have that freedom from the attractions of worldly life which is necessary for the reception of God's love in the heart.

But even then the disciples could not understand. "Who then can be saved?" they asked anxiously. And Jesus, looking upon them, said "With men it is impossible, but not with God: for with God all things are possible."



# JESUS THE GOOD SHEPHERD



In this beautiful picture we see Jesus represented as the Good Shepherd who cares for the sheep, and seeks the wandering lamb over hill and dale and thorny steeps until He finds it, and brings it safely back to the fold

This picture is reproduced from the painting by Sybil C. Parker by permission of the Bertha Photograph Company. The picture on page 397 is from a painting by Henry Tides reproduced here by permission of Mrs. Fuller



Howard, the eldest daughter of the Earl of Berkshire, that he turned to writing for the newly-opened theatres as a means of support. On the whole, his plays, though frequently containing notable passages, are unworthy, and we have only to compare the best of them with the poorest of Shakespeare's to realise how very poor they are, although Dr Samuel Johnson, one of the least trustworthy of critics, would seem to rank Dryden before Shakespeare.

**JOHN DRYDEN, THE POET LAUREATE WHO WAS A JACOBITE**

When James II., brother of Charles II., came to the throne, and England seemed in danger of becoming a Roman Catholic nation, as the new king wished to impose papacy on the country, Dryden also became a Roman Catholic. This is often mentioned to his discredit; but there is little doubt that the poet was not guilty of the meanness of changing his religion to curry favour with the new king. He had been tending for some years towards the Roman Catholic faith, and, later, when William and Mary were called to rule the land after James had fled, Dryden remained a faithful Catholic, thereby losing what he had previously gained in the way of royal favour.

One of his most beautiful poems, "The Hind and the Panther," is written in praise of the Roman Church, which he likens to the "milk-white hind, immortal and unchanged," the Church of England being the panther, "fairest creature of the spotted kind," while the other Protestant Churches are likened to other animals of different kinds.

**WHEN DRYDEN WAS AN OLD MAN AND POPE WAS A LITTLE BOY**

Dryden's great power took the shape of satire, and some of his finest verse is that in which he gives us biting pictures of historical personages. In his later years he adapted into English verse the works of the Latin poet Virgil, and, although these translations were well received, they do not give us a very good idea of the original, which is warm with all the sunshine and glowing beauty of Nature, whereas Dryden's verse is cold and glittering, like diamond-studded jewels. On May 1, 1700, Dryden died, and was buried in Westminster Abbey.

When Dryden was an old man, the most eminent literary figure of his day,

there were people always keen to see him on his daily visit to a coffee-house where many men of note were in the habit of meeting. One day, not very long before he died, the celebrated poet was pointed out to a little boy who had been brought there by a friend; and this pale-faced and delicate little fellow, when he grew up to be as famous as Dryden had been, never forgot this glimpse of his master. Already, as a boy of eleven, Alexander Pope was an intense admirer of Dryden's poetry, and had begun to write poetry himself, imitating Dryden's style. Despite his delicate health and stunted form, Pope was a marvellous student when only a child, and by the age of twelve he had written some most remarkable poems, at least one of which, "On Solitude," might be taken for the work of an elderly and thoughtful man.

He was born in London, on May 21, 1688, his father being a wealthy linen-draper, who had joined the Roman Catholic Church, like Dryden, and who, in disgust at the new reign of William and Mary, had withdrawn to a house near Windsor Forest, where the early years of his son Alexander were spent.

**THE BOY OF SIXTEEN WHO RESOLVED TO BECOME A GREAT POET**

The boy received some instruction from priests, but had no regular education, though his great thirst for learning, and the wonderful activity of his young mind, did much more for him than any ordinary course of education would have done. He was extremely well read in the classic authors, and throughout his poetry we find him constantly making use of the ancient stories of the gods and heroes of Greece. He was only sixteen when he determined to be a poet, and by twenty-three he had finished and published his famous "Essay on Criticism," a comparatively short poem, full of the most remarkable literary knowledge and ripe judgment. It contains many lines which are constantly being quoted, such as "To err is human, to forgive divine," and "A little knowledge is a dangerous thing." This poem left no doubt that its young author was a man of genius.

Although, on the whole, Alexander Pope was not what we should call a lovable character, he was probably a better friend, and kinder, than his



every day life and the changing seasons. Cowper's father was a clergyman, and, his mother dying when he was about six years old, he was sent to a boarding-school where he led a very miserable life for two years, before he became a scholar at Westminster School. At sixteen he entered a law-office, and when twenty-three he had qualified as a barrister, but did little or no legal work, living a quiet and pleasant life in the Temple, and writing a little for the publications of the day. Some twenty years later, a relative secured for him an important position in the House of Lords, but the poet was so shy of appearing in public, as this office required him to do, that another post was suggested for him, and for this he had to pass an examination, in preparing for which he overtaxed his mind, and had, for a time, to be confined in an asylum.

**THE SHADOW ON THE LIFE OF WILLIAM COWPER, THE GENTLE POET**

A tendency to melancholy was the result of this mental disturbance, and for the rest of his life, though enjoying long periods of happiness, he lived under the shadow of the dread return of his malady, but he was fortunate in the tender love of friends, won to him by his gentle nature.

Apart from his many and beautiful poems, Cowper was one of our most charming letter-writers, and from one of his letters we take a description of himself "As for me," he writes, "I am a very smart youth of my years. I am not, indeed, grown grey so much as I am grown bald. No matter. There was more hair in the world than ever had the honour to belong to me. Accordingly, having just found enough to curl a little at my ears, and to intermingle with a little of my own that still hangs behind, I appear, if you see me in an afternoon to have a very decent head-dress, not easily distinguished from my natural growth, which, being worn with a small bag and a black ribbon about my neck, continues to me the charms of my youth, even to the verge of age." At East Dereham, Norfolk, April 25, 1800, this sweet singer, but afflicted man, passed to his rest.

The next great poet in the order of birth had died four years before Cowper, although he had been born twenty-eight years later. The name of Robert

Burns has a more universal fame than that of his elder contemporary, whom as a man, he resembled in no way, but whom he outshone as a poet by reason of a wider range of feeling and a still greater sweetness of song.

**THE SCOTTISH FARMER'S SON WHO BECAME A WORLD-FAMOUS POET**

The story of Burns is, in some ways, sadder than that of Cowper. He was a great poet, who left us a splendid legacy of poetic beauty, but he might have given us so much more, had he not, largely through his own folly, died too soon, with many a gem of song unsung.

Burns was born at Alloway, near the town of Ayr, on January 25, 1759, and being the son of an intelligent farmer, who justly valued education, he received a good and serviceable training as a boy. This should be remembered, for he is too often described as a "peasant poet," assuming him to have sprung from a race of farm labourers. Although, in his youth he did engage in farm work, we must not confuse him and his people with the uneducated rural clods of his time. He had, indeed the good fortune to have for tutor one who had a real love of literature, and so cultivated the taste in his pupil that, early in life, Robert began the study of literary form, by which we mean not merely the reading of poetry because it pleases us, but the examining of the very words and phrases, to discover how the poet builds up the beautiful word-pictures which engage and please our fancy.

**WHEN ROBERT BURNS WROTE HIS GREATEST SONGS AND POEMS**

While still employed with the work of his father's farm, much of Burns's time was spent in studying the poets, and particularly those who wrote in the tongue of his native land, such as Allan Ramsay and Robert Fergusson. When he was twenty-five years of age, his father died, and the poet himself became farmer on his own account; but, being without money, he soon got into difficulties, and being a poet, instead of a man of business, he sought to free his mind of his troubles by forgetting about them while he wrote his poems. For all the world the results were glorious, and in one marvellous year he had written poems enough to make his name immortal "The Cottar's Saturday Night," "The Jolly Beggars," and "The Address





years old at the time when Burns died, but who had not yet become famous, was William Wordsworth. He was born at Cockermouth, in Cumberland, on April 7, 1770, and the greater part of his long life was passed in the beautiful Lake District, not far from his place of birth. The life of Wordsworth was, happily, the very reverse in every respect from that of Robert Burns, and, as a consequence, although he lived to be eighty years, there is less to say about him.

**THE YOUTHFUL DAYS OF WILLIAM WORDSWORTH, AND HIS FIRST BOOK**

It often happens that the lives of men who have been foolish or unfortunate, and have died while still young, are more interesting to tell than those of men who have lived long and happily. Wordsworth came of a good family, and, his parents dying when he was young, he was well looked after by his uncle, being sent to a private school, and later to Cambridge University.

As a young man, Wordsworth spent some time in Switzerland and in France during the distracted period of the French Revolution. When he was twenty-three, he published his first modest book of verse, in which he describes some of the sights he saw abroad. His book did not attract great attention. But here and there some persons of good taste—and particularly his younger brother-poet, Samuel Taylor Coleridge—read it, who realised that its writer had the gift of true poetry. Simplicity of words, combined with lofty thought, and the truthful picturing of natural scenes, were the ideals at which the young poet aimed, and these, throughout his long life, he always strived after—if not always successfully.

**WORDSWORTH'S SERENE AND HAPPY LIFE AS AN HONOURED POET**

While his friends would have had him become a clergyman, he seems to have been more inclined to the law and literary work, and, coming into a small legacy at the age of twenty-five, he was, for a time at least, relieved of the need to earn his living. A few years later, the payment of a large sum of money, which the Earl of Lonsdale had owed Wordsworth's father, provided the poet with a sufficient income, so that he was free to give all his thoughts to his beloved art of poetry. He had settled with his sister Dorothy in a cottage at

Grasmere, and their companionship was not disturbed by his marriage, in 1802, and is one of the pleasantest chapters in literary friendships. Wordsworth was, indeed, fortunate in many ways; he never knew the pinch of poverty, his friends were many and faithful, and his whole life was serene and happy, flowing like a gentle stream through green pastures. He was honoured and admired by the great men of his own day, and, on the death of his friend Southey, he was appointed Poet Laureate. He died on April 23, 1850, and was buried in the churchyard of Grasmere. Of all our great poets, he was perhaps the most unequal, for, although he wrote much that was perfect, he wrote a great deal that was feeble and colourless, but as a writer of short poems, called sonnets, no English poet has ever excelled him.

**SAMUEL COLERIDGE, THE DREAMY POET WHO WROTE "THE ANCIENT MARINER"**

Samuel Taylor Coleridge was two years younger than his friend Wordsworth, having been born in Devonshire, on October 21, 1772. He was the youngest child of a poor country vicar, and his schooling was received as a charity boy at the old Christ's Hospital in London, perhaps better known as "The Bluecoat School," because of the uniform of its scholars. He was a remarkably apt and brilliant scholar. In habits he seems to have been the dreamiest of boys, but his dreams were born of his deep and intelligent interest in the great works of literature. At Cambridge University he gave promise of his remarkable powers, but, getting into debt, he enlisted in the dragoons, for which service, of course, he was totally unfit. His captain released him after a few months, on discovering that his recruit was better fitted for the study than the barracks, and he returned to Cambridge for a time.

We next find him at Bristol, with his friend Robert Southey, dreaming bright dreams of a new and happier life across the Atlantic—dreams never to be realised. Still hard pressed for the means of life, he married and settled down for some three years in a Somerset cottage, writing in this period some of his finest poetry. "The Rime of the Ancient Mariner" and "Christabel" were two of his poems written here.



Hucknall Toikard, near their beautiful home of Newstead Abbey, which has long since passed into the hands of another family. So greatly had the romantic personality of the poet and the glamour of his poetry impressed themselves on his countrymen, that it is doubtful if the death of any other famous poet has ever occasioned so much emotion as that of Byron. Tennyson himself has told us that when he heard Lord Byron was dead he felt that nothing else mattered, and, certainly, when the poet breathed his last, at Missolonghi, one of the most powerful voices in English poetry was stilled.

#### THE STORMY LIFE AND TRAGIC DEATH OF THE POET SHELLEY

Another poet whose fate was also to become a wanderer abroad was Percy Bysshe Shelley, born on August 4, 1792, near Horsham, in Sussex. Shelley was a fair and beautiful youth, perhaps less manly in appearance than Byron, whose fine head and ardent eyes suggest at once the poet and the man of independent spirit. Shelley, like so many of the young men of his day, had imbibed revolutionary ideas, as a result of the great revolution in France, and with these was united in him an unhappy revolt against the teaching of Christianity. The result was an ill-ordered and unrestful life, for, though his poetic genius greatly enriched our English literature, with such fine works as "Prometheus Unbound," "Adonais," and the "Ode to the West Wind," we cannot help feeling that his life was unhappy and his end tragic. He was drowned off the coast of Italy, on July 8, 1822. His body was washed ashore near Viareggio, and it was cremated in the presence of some friends, one of whom was Lord Byron, his ashes being placed in a casket, and afterwards interred in the Protestant cemetery at Rome.

#### JOHN KEATS, ANOTHER GREAT POET WHOSE SUN WENT DOWN TOO SOON

In that same burial-ground lie the remains of another great English poet, who was a friend of Shelley, and who had died in the year before the latter was drowned. This was John Keats, who was born in London, October 31, 1795. Though only the son of a livery-stable keeper, and doomed to die before he had reached the age of twenty-six,

he had yet, in his short life, by the grace of genius, made his name immortal. His poetry has the curious quality of being at once classical and natural. That is to say, steeped in the knowledge of the ancient writers upon whom the great poets of the Elizabethan era had modelled their verse, Keats wrote with all the artificial beauty of the Greeks, while yet he contrived to convey a sense of the freshness and sweetness which comes only direct from the love of Nature, as we find it in Chaucer and in Burns. One of his finest poems, "To a Nightingale," is on page 2722. He died of consumption while at Rome, on February 23, 1821.

Unlike the last three poets of whom we have been speaking, the next great writer who calls for our attention was to enjoy a long life of serene happiness. Alfred Tennyson was born at Somersby Rectory, in Lincolnshire, August 6, 1809, being the third of six sons. Although his name is pre-eminent among the poets of the nineteenth century, had he died at the age Keats was when he passed away, it is doubtful whether he would have been so well remembered to-day, for Keats at twenty-six had given us even finer gems of poetry than Tennyson had produced at the same age. This will serve to show us how much the world must have lost by the untimely death of Keats.

#### THE YOUTHFUL DAYS AND EARLY WRITINGS OF ALFRED TENNYSON

Tennyson was brought up in a bookish atmosphere. His father, to whom his early education was due, was a man of literary taste; both his elder brothers were poets. At Cambridge he gained a medal for a poem, and in 1826, nearly two years before going to the university, he had joined his brother Charles in publishing a volume entitled "Poems by Two Brothers," which has long been one of the treasures of book-hunters. He was thus a poet at sixteen, and a poet he was bound to continue, as poetry was the passion of his life. His first independent work, published in 1830, and a second series two years later, were received so coldly by the critics that nearly nine years elapsed before he ventured to publish another, yet in these books were such poems as "The Lady of Shalott," "The Lotus-Eaters," and "The Queen of the

WHEN TENNYSON WAS A YOUNG MAN



life was passed, and in 1870 he became the owner of a singularly beautiful house, specially built for him at Aldworth, in Sussex, set on the edge of a woody hll, and looking clear across the rolling downs towards the south coast. Here, and at Farringford, he enjoyed many years of serene and happy life, the undisputed king of the literary world of his day. In 1884 his services to English literature were recognised by his elevation to the peerage as Baron Tennyson of Freshwater and Aldworth. On October 6, 1892, he died at Aldworth, and was buried in Westminster Abbey. His life has been written by his son, the present Lord Tennyson.

There was another great poet, very different from Tennyson in many ways, whose life ran its course with that of Tennyson. Robert Browning was born in London, May 7, 1812, so that he was but three years the junior of Tennyson, who also outlived him by three years, Browning dying on December 12, 1889.

#### A COMPARISON OF THE TWO GREAT POETS BROWNING AND TENNYSON

Like Tennyson, Browning began to write poetry at a very early age, his first published work having been written when he was nineteen. His early education was chiefly derived from travel abroad, and Italy, as we have seen in the case of other poets, had much to do in influencing the poet's mind.

Like Tennyson, he sought to inspire his fellow-men with hope, but there is, perhaps, in his poetry a stronger feeling of courage than we find in Tennyson. His verses are rugged and unhewn, like the rocks on the seashore, while Tennyson's are polished and sweet with music, like a beautiful Italian garden with its fountains. He is not so easy to understand at times, as he often tries to express more thought than his words can carry. In short, he is to be considered a greater thinker than a poet, although we have seen that in such pieces as "The Pied Piper of Hamelin," on page 533, and "How they Brought the Good News from Ghent to Aix," on page 2291, he could tell a moving story in clear and memorable words.

There were many contrasts in the characters of Tennyson and Browning. While the one loved to appear a poet in his person, as well as in his works, the other endeavoured always to be

regarded as an ordinary man of affairs. Tennyson was somewhat inclined to withdraw himself from his fellow-men, Browning thrust himself boldly into the everyday life of his time, although we cannot suppose that he had a lesser love of poetry than Tennyson had. But there is little doubt that Tennyson was the greater poet of the two, his works must outlast those of Browning in the affections of all readers.

#### ELIZABETH BARRETT BROWNING, ENGLAND'S GREATEST WOMAN POET

Some people even consider, though not quite wisely, that Browning's wife, whose maiden name was Elizabeth Barrett, was a finer poet than her husband. It is true that, although Browning was thirty-four when he married, and had written several notable works, his wife's fame was then greater than his own.

Mrs. Browning was indeed a remarkable woman. Born in Durham, March 6, 1806, the daughter of a wealthy landowner, she was so clever as a child that, when a girl of ten, she could read the poets of Greece in their native language, and at fourteen she had herself written a poem of some merit. An injury received when she was about eighteen made her an invalid for many years, during which poetry was the solace of her life. Her gentle nature, her warm love of the poor and oppressed, and her steadfast faith in the goodness of God, are all admirably expressed in her sweet and eloquent poetry, of which "Aurora Leigh," a work of considerable length, is perhaps the finest and purest flower.

#### THE LAST DAYS OF ROBERT BROWNING AT HIS PALACE IN VENICE

When the Brownings were married, in 1846, they left England, and took up their home in the lovely Italian town of Florence, about which we read on page 2779, and there, on June 30, 1861, Mrs. Browning died. Her husband survived her for many years, and towards the end of his life he removed to one of the fine old palaces that stand along the Grand Canal in Venice, as seen in the pictures on page 3017. There Robert Browning passed away, on the very day that his last book of poems, "Asolando, Fancies and Facts," was published, but his body was brought to England, and buried in Westminster Abbey on the very last day of 1889.

The next Men and Women begin on 3981

# THINGS TO MAKE AND THINGS TO DO



## HOW TO KNOW SAILING SHIPS

To hear men talk about sailing ships is sometimes very confusing. Many boys and even men who live by the sea and see at least a few of the crews and come into harbor, do not know the names of the various kinds of ships, and can not discuss with me the kind of ship from another. They may hear an old sailor or two talking about a schooner and a long wharf, but they do not know the names of these things. They may see a ship in an excursion, but they do not know the name of it, or the name of the ship.

What is different kinds of ships are like, but there will be no excuse for us if we do not know them, because this article will tell the names of the ships in a few lines. I have been very much interested in sailing ships, and I have been very much interested in sailing ships, and I have been very much interested in sailing ships.

It is the only way to learn the names of the ships, and I have been very much interested in sailing ships, and I have been very much interested in sailing ships.

At the same time, I have been very much interested in sailing ships, and I have been very much interested in sailing ships.

It is the only way to learn the names of the ships, and I have been very much interested in sailing ships, and I have been very much interested in sailing ships.

The four are the most common kinds of sailing ships, and they are the most common kinds of sailing ships. They are the most common kinds of sailing ships, and they are the most common kinds of sailing ships.

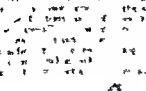
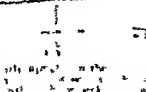
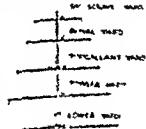
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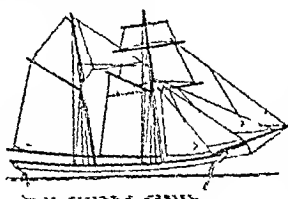
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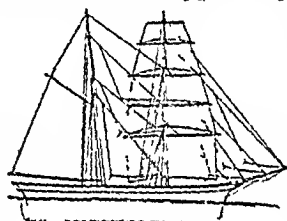




6 Ordinary schooner

in picture 2. A mast cannot have more than one boom and one gaff, but it may have several yards. The bottom yard is always called the *lower yard*.

The one above it is the *topsail yard*, or if the topsail is in two parts, the two parts are called the *lower topsail yard* and the *topsail yard*, respectively. Above the top sail is the *topgallant yard*, or if the topgallant sail is in two parts, the two parts are called the *lower topgallant yard* and the *topgallant yard*, respectively. The yard above the topgallant yard is called the *royal yard*, and if there is one higher still, it is known as the *skyscraper yard*. Now, if we remember



9 Brigantine

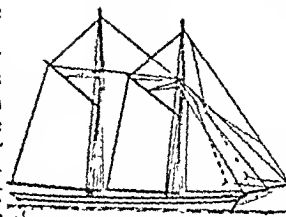
these points about masts and sails we are ready to consider the *rigs* of various ships.

The name given to the sails and their disposition on the various masts and spars is the *rig*.

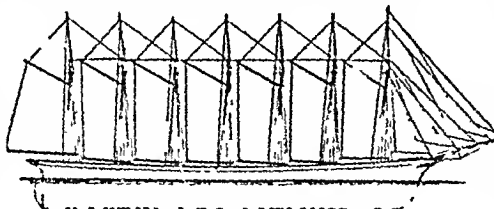
Small sailing ships and yachts have what is called the *cutter rig*, which is seen in picture 3; there is only one mast, and the *mainmast* is stretched between a boom and a gaff. The *jawl* is very like a cutter, but has a very small mast behind the mainmast, as seen in picture 4. The *jawl* is generally a little larger than a cutter

mainboom is the boom on the mainmast, the *mizzen-gaff* is the gaff on the mizzen-mast and so on. The sail between a boom and a gaff is called a *trysail*, and is illustrated

The *ketch* is the same as a *jawl*, but the rear, or after, mast, is larger. It is seen in picture 5. The *rig* of the *schooner* is the most common on sailing ships, and although steamers may not have sails at all, if they have sails these are the schooner rig. There are two kinds of schooner rigs: the ordinary schooner rig, and the fore-and-aft schooner rig. The ordinary schooner rig, which is seen in picture 6, has a foremast with a topsail and topgallant-sail, but a trysail instead of a lower yard-sail, and on the rear, or main, mast there is

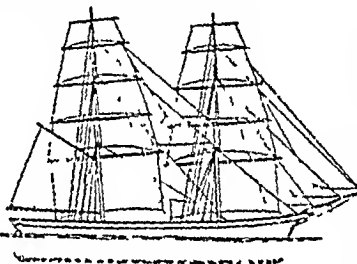


7 Fore-and-aft schooner



8 Fore-and-aft seven-masted schooner

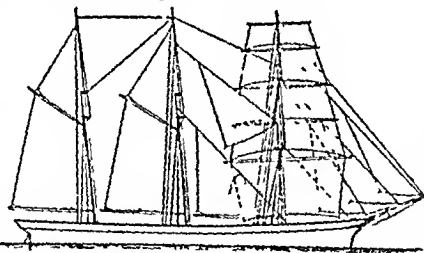
a trysail and topsail schooner rig has also on its mainmast top and topgallant-sails, but in a mainmast with trysail and topsail only are the more common



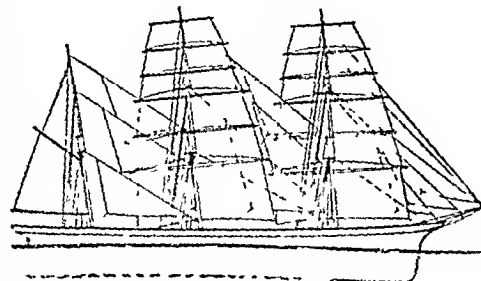
10 Brig

The fore-and-aft schooner rig has no yardsails but only trysails, which are generally uniform on all the masts. In picture 7 we see a two-masted schooner with fore-and-aft sails, and in picture 8 is shown a seven-masted schooner with fore-and-aft rig. A schooner may have as many masts as may be found convenient and still be a schooner.

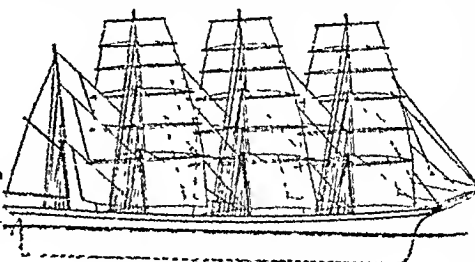
If a schooner of the ordinary rig type has more than two masts, the foremast only has yards, the remaining masts, whatever their number, having trysails only.



11 Brigantine



12 Three-masted barque



13 Four-masted barque

## HOW TO KNOW SAILING SHIPS

The brigantine rig is the same as an ordinary schooner except that the foremast has a crossyard but only yard is seen in picture 9. It may have a fore yard and yard like those seen in the picture but it has no trysail on the foremast. The brigantine rig is not a very common nowadays and when it is found the ship has very few more than two masts.

The rig of the *Long* is an interesting type. It also has only one two-masted vessel as seen in picture 10. But a main or rear mast has the function of an

red navy and orange, with garlands and wreaths  
in red and orange with yellow beads.

The kitchen line is seen to extend in three east-facing spans. It is a picture which shows that it is the longest line with a narrow end.



12 At 1096d-1097a.

The most popular type of lamp is a slope is the *Argus*. It requires a 10-watt bulb and three feet. The most about the storm is a travel but the most of the valves at 1 yard x 1 foot 2 ft x 2 ft.

11.  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. The first part of the text discusses the importance of understanding the context of the data being analyzed. It emphasizes that without proper context, any conclusions drawn from the data may be misleading or incomplete.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.

for good & faith by  
 the fact that I was  
 the only one to be  
 the only one to be

2. 100% of the total value of the property  
 3. 100% of the total value of the property  
 4. 100% of the total value of the property

*(faint handwritten notes)*

have seen turned at 12:30. (See also 10/11/77)  
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## ICES MADE WITHOUT A FRELZER



# HOW TO KEEP ANTS AS PETS

THE habits of ants are so interesting that men of science have spent a great part of their lives studying them and their habits. We read something about these wonderful little creatures in that part of this book that begins on page 2941, but we may ourselves keep ants as pets in our drawing-room, and very interesting they are. The glass case in which ants are kept in the house is called a *formicarium*, a word that is made up from *formica*, the Latin or scientific name for the ant. *Formicarium* may be bought all ready and complete at some shops, but it is much more interesting to make our own, and as it is easy to do this, we will first of all see what is needed.

We must get two sheets of glass, say, twelve inches square, two strips of glass twelve inches long and half an inch wide, and two strips ten inches long and half an inch wide. These may be bought at any glazier's, cut to the sizes named, for a few pence, and ordinary window-glass will do very well. Now we must take one of the squares, and fasten the two ten-inch strips and one of the twelve-inch strips round the sides, flush with the edges, as shown in the first picture. Either glue or seccotine may be used for this purpose. Then, when the strips are dry, we must stick the other sheet of glass on the top of them, so that we shall have a shallow box without a lid, and with the narrow sides not reaching quite to the top of the wider sides of the case.

The *formicarium* is all ready to receive the earth from which the ants are to form their nest or camp. The very best mould for this purpose is, of course, that to be obtained from an ant-hill, and this we can get in almost any garden or field in town or country. The earth may be put into the glass case by pouring it in at the top through a paper funnel, made in the same way that a grocer's sugar-bag is made. Sufficient earth is needed to half fill, or a little more than half full, the *formicarium*, and a vacant space should be left in the centre with passages to top, which consists of the ten-inch strips. The inch strip of glass, is then put on the top, and our *formicarium* all ready for the ants, with two doorways or openings, one on each side, and the appearance of the case is as shown in picture No. 2.

We have next to catch our ants. Any kind we will do, and we shall probably find what we want in our garden. We must dig down deep into the encampment to find the queen, who can easily be distinguished by her large

size. The pictures on page 2945 of this book will perhaps help us. A bottle is a very good thing in which to carry the ants from the garden to the room where we are making our *formicarium*. Having put the queen in the bottle, we can place with her about fifty worker ants.

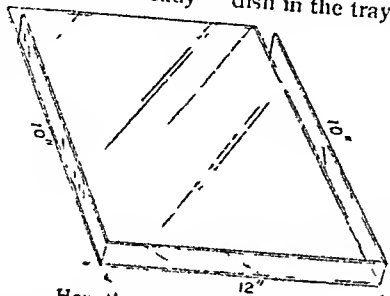
The next task is to get these into the glass case. We must close up one of the little doors with rag or wadding. Then, if we take a tea-tray and fill it with water, and stand a dish in the tray and then lay the *formicarium*

on the dish, the ants' new home will be cut off by water from everywhere. We cover the glass case with a newspaper folded up, and lay our bottle on the paper with the cork out. The ants soon swarm out and all over the paper, but we guide the queen ant towards the opening of the *formicarium* and get her in, when the worker ants

will all follow, and that very soon. Directly they are in, we should plug up the doorway with a piece of wadding, and our *formicarium* is complete. We may, of course, ornament it in any way we like, but this is a matter of taste. The ants will soon get to work, and for hours we may watch them making their homes and performing their various duties without any fear of our getting tired, for there is no more absorbing recreation than watching an ant city being built.

The *formicarium* should be kept in a shady place, and when not being watched a cloth may be thrown over it. It must never stand in the sun, and it is better to examine the ants by artificial light, as the little creatures do not mind this at all, whereas they do not like daylight, and will soon get out of sight if exposed to it. The earth should be kept moist by squirting a very little water into the case from time to time with a small syringe or a fountain-pen. The only food needed by the ants is a little honey placed inside the opening every day or two. A few of the little white creatures that ants make pets of, should be put in the nest, as they act as scavengers, and keep the ant city clean.

Thus completed, we have one of the most wonderful things that can be seen. The ants will make tunnels and corridors and lanes and rooms, and nurseries for their young ones, with front doors and side doors, and all the different kinds of ants will do their eyes. As they have not the chance to get at another nest of ants, they will do no fighting, which is the least nice of all the habits in which the ants are so like men.



How the glass case is built up



The *formicarium* ready for the ants

## MAKING A CARDBOARD STEAM-ENGINE

THE new belt can be worn in either direction, looks very smart and easy to wear. It is made out of caribou and is a useful bit of knitting, wool and other soft and warm materials. Any boy can be his own maker for himself if he will take pains to follow the method indicated in the pictures. The total length of a boy's belt is 30 inches, and it is made of a heavy material, such as flannel, or a heavy material, such as flannel, or a heavy material, such as flannel.

[illegible][illegible]

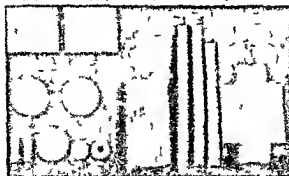
I have been thinking of you a great deal lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I will try to write you more often. Love, Mom.



I have a question about the above information. Please let me know.



1. I have been a member of the American Medical Association since 1954.



1. The first step is to identify the problem or question that needs to be answered.

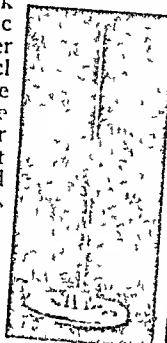
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# THINGS TO MAKE AND THINGS TO DO

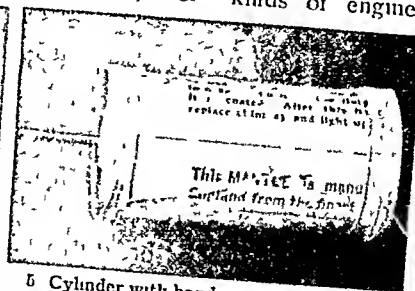
marked K in picture 3, are used to strengthen this steam-chest. When the steam-chest is fixed together and dry, we gum it to the side of the cylinder as shown in picture 7. We bore a hole in one end and fit a piston-rod to it, made from a smaller piece of knitting-needle. We then rub down the edges of

the various parts together by referring to the photographs. When all is completed, we may give the little engine a coat of enamel, using several colours. Of course, we need not make an engine exactly like the one which is here described. Many different kinds of engines and machines can be

modelled by using the simple materials which have been mentioned here. We may make a model factory with different machines to do different kinds of work.



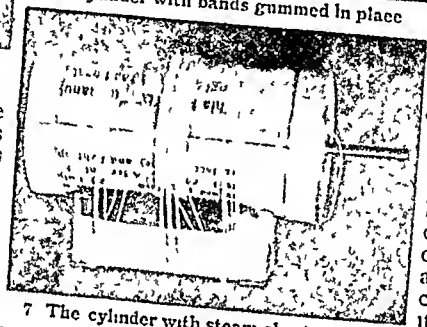
4 Piston



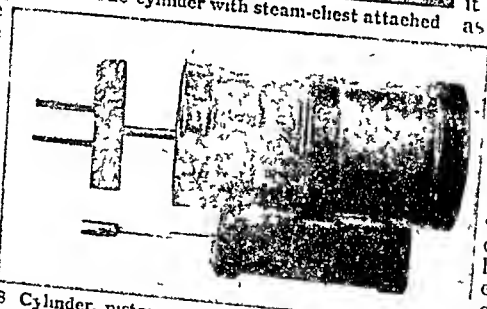
5 Cylinder with bands gummed in place



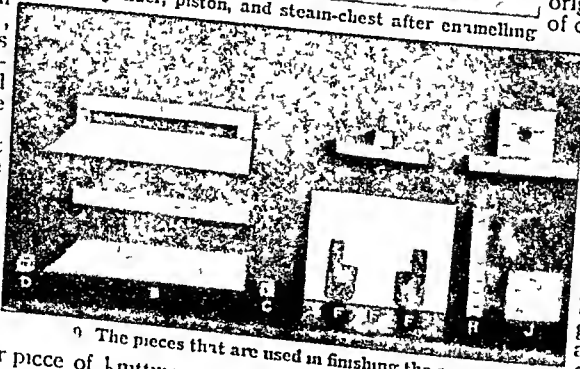
6 Steam-chest



7 The cylinder with steam-chest attached



8 Cylinder, piston, and steam-chest after enamelling



9 The pieces that are used in finishing the engine

the piston-head. The parts for this, marked I and G in picture 9, are best cut out of thinish wood. They are then gummed and fitted very carefully to the end of the piston. It is now a good plan to gum the cylinder upon its base firmly, because when it is in place we will find out more easily the correct size for the other parts of the model. Parts A, B, C, and D in picture 9, when gummed together, make a guide for the piston-head, as shown at E, of which two will be necessary. The parts of the bearings for the wheels are shown at H and J in the same picture, while K shows them fitted together and bored out to receive the axle of the wheel. We shall find it best to plug the centre of the wheel with wood, and then to bore through the wood a smaller hole, just big enough to receive the axle, which is easily made from another piece of knitting-needle.

If we have followed carefully the above descriptions, we shall find it an easy matter to construct the crank and connecting-rod out of little blocks of wood and pieces of knitting-needle, while we can see how to fit

We shall find plenty of nice thin wood easy to cut, in old cigar-boxes; the paper should be damped and peeled off. Corks may be taken from empty bottles in the pantry, and cardboard boxes are easily obtained

boilers, model stokeholes, and so on. The very best way for us to set about making models of any kind is to choose some object that we see almost every day, such as a ship, an engine, a house, or a church, and then to copy it in miniature as carefully as we can. We shall do well to pay particular attention to the general form and outline of what we are copying, as well as to the colours that we use—not worrying about the tiny details. For instance, when we set out to make a model house, we cannot copy every brick in the original, but by means of careful colouring we

can make our model look as though its walls are really brick-work. In making model engines we shall do well to bear in mind a few hints which will tend to make our work less difficult. As we have seen, the general materials are wood, cork, cardboard, and knitting-needles.

# SIMPLE WAYS OF MAKING DESIGNS

Whether we are girl and are fond of needlework embroidery or patching, or whether we are boy and do wood-carving, modelling, painting with an awl and stenciling, we shall find it convenient to have a pattern. Here we shall see how simple it is to make our own designs which are as good as those of the artist.

We are only going to use ordinary everyday things to help us to make our patterns—three coins to make a ball pattern, a ball of twine, a piece of a rule and a piece of leaded paper.

First let us take a pattern for a ball. This pattern is made with a penny, a halfpenny, a farthing and a string. To begin with we must be sure that our pencil has a sharp edge for it.

We first rule a line in the paper. Then we take a penny and a halfpenny and place them on the paper over the line. We shall find that they will not overlap.

Now we take a string and place it over the coins. We shall find that it will not overlap.

Then we take a piece of leaded paper and place it over the string. We shall find that it will not overlap.

Now we take a piece of paper and place it over the leaded paper. We shall find that it will not overlap.

Then we take a piece of paper and place it over the paper. We shall find that it will not overlap.

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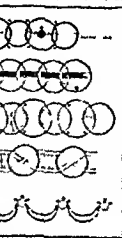


Fig. 1. Ball pattern made with coins.

Then we take a piece of paper and place it over the paper. We shall find that it will not overlap.

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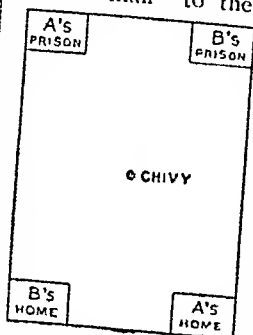


Fig. 2. Ball pattern made with coins.

# OUTDOOR GAMES FOR BOYS

## PRISONERS' BASE

THE playground, or part of it, should have four spaces marked off—one in each corner, as seen in the picture. The distance between the prisoners and homes should be not less than twenty yards. The players divide themselves into two parties, A and B, each party selecting a captain. They then go to their separate homes, and one of the captains sends out "a man" to the place marked in the



centre, where he calls, the words, "Chivy, chivy!" Out darts one of the enemy to capture him before he can reach home again. But this pursuer has hardly started when one of "Chivy's" friends rushes out to catch the pursuer. Thus one after another all the players leave home, but no one

must on any account try to touch any boy except the one he left home to follow. Above all, each should not forget that while he is seeking to capture the enemy, another of the enemy is seeking to catch him. This makes matters exciting. A prisoner is made by simply touching a boy, and once this is done the toucher is safe until he has taken his captive to goal. He may then walk "home" and wait to be ordered out again by his captain. Prisoners are released by one of their own side touching them as he runs by the prison, and if there are many inside, they may join hands and stretch out to meet their friends, so long as the last in the line keeps one foot in goal. The side that succeeds in making all the others prisoners wins the game, but it has to be a very clever captain who can direct his men so as to manage to do this.

## FLY THE GARTER

To start with, all the players make a running jump, and the one whose jump is shortest has to "give a back" for the others. A chalk line, called the garter, is drawn, and standing close beside this he bends his back and tucks in his head. When the others have gone over him as in leap-frog, he is told to "foot it"—that is, move away from the line the length of his own foot, and bend down again. This time, in going over, each player must start his jump from the "garter," and if all succeed in doing this, the "back" moves on another foot for the next turn. By and by the distance from the garter becomes too great for one of the jumpers, and the first to make a false leap must take the place of the "back," who then joins the others.

## FOX IN THE HOLE

THE "fox" stands on a piece of ground marked off for him to live in. He is allowed to carry a knotted handkerchief for self-defence. When the hunters come to attack, he hops out to meet them on one foot

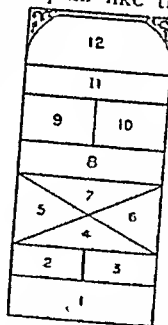
During the battle that follows he must not put his second foot to the ground, or, if he does, he will be basted home again without the right to hit back. If, however, he touches one of the enemy with his knot while hopping, the one so touched is basted by the rest into his home and becomes fox in his stead. While in his home the fox is quite safe from attack.

## PEE KU

HAVE the number of players join hands in a circle, forming what is called a fortress, which the other half seek to take by forcing their way into the middle. The defenders must not loose each other's hands, but may raise them or lower them to stop the attackers getting over or under. They may spread themselves out or draw together in a closer circle when danger is near, and they may change their positions to stop anyone crawling between their legs. If an enemy gets through, he may assist his friends who are trying to follow him, and when half the number are within the fortress, it must "haul down its flag and surrender" to the victorious party.

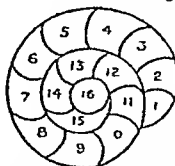
## HOP-SCOTCH

THE game of hop-scotch is played in different ways, but the way which we shall see here is the usual one. We first draw on the pavement of the playground with chalk a plan like this. The larger divisions are



about two feet wide. The first player then stands at a short distance and pitches a flat stone or piece of shell into No. 1. If it settles properly in the space, he hops after it and kicks it out again without putting his other foot to the ground. Returning to the starting place, the shell is again tossed, this time into No. 2, and the player hopping after, kicks it out once more, but through No. 1. This action

is repeated through every division up to 12, unless the shell settles on a line or is pitched into the wrong division. In either event the player stops and the next player takes his turn. Though only hopping is allowed, any player who gets as far as division 8 may rest by putting one foot in No. 5 and one in number 6, but must go on hopping when he turns to kick the shell out again. On each return journey he may hop and kick as often as he likes, except when the shell has been tossed in No. 12—or the cat's head, as it is sometimes called. That time he must kick it out at one kick right through all the divisions. But if he does so, he has won a game, and his hopping labours are over. In French hop the plan on the pavement is drawn like this. The shell is placed in No. 1, and the hoppers kick it through each division till No. 16 is reached. After a short rest it is kicked back the reverse way to No. 1 and out





# A LITTLE VEGETABLE GARDEN WHAT TO DO IN THE MIDDLE OF AUGUST

ANOTHER seed-sowing season has come round again, indeed, as we have seen, there are now months from early spring to late autumn when we may not sow one thing or another. In August the most important crop to think about is the onion. The onions that were sown in the spring, and have been growing all through the summer, are by this time almost ready to lift and dry—much depends, of course, on the district and the date at which they were sown—for winter use. We can even use them for some time in the spring. Then the time comes when, of their own accord, they begin to sprout, and sometimes even to produce fresh roots, then, of course, they are of no more use for cooking. The seeds that we sow in the month of August are intended to produce a crop to follow these winter onions. We should choose a position that gets as much of the winter sunshine as possible, and the kind of onion to sow at this time is the Tripoli.

Another crop, the seed of which we may sow now, is the winter spinach, very often it is sown on the ground that has been occupied by the potatoes. It is important to sow thinly, and when the seedlings are well up, it is necessary to thin out the little plants until they stand six inches apart in the rows.

During this month many people also sow a row or two of turnips, so as to have young roots for use during the winter, but in small gardens we cannot grow everything, so we must make our choice, and decide which will be most acceptable in the kitchen.

But still we have not come to the end of the vegetable seeds we might sow, and mention may well be made of lettuces. The kind to select is known as the brown cos.

## A FLORAL

ON another page we read how to make artificial flowers. We can turn the art to account in a practical fashion, and make a bouquet of paper flowers that will tell us what the weather is going to be. So let us make some flowers out of pink paper, and some others out of blue paper. Any kind of flowers will do, so long as we use these two colours. We can make either a big or a small bouquet.

Now we purchase from a chemist a few pence worth of chloride of cobalt, and dissolve it in water. When it is dissolved, we dip the flowers into the solution we have made, then bring them up to dry. If the solution is weak, we may dip them in a few times, letting them dry before every repetition of the bath. That is all we need. The floral barometer is ready for its work. When the weather is going to be damp the flowers made of pink paper will remain pink, but when it is going to be dry, they will change into a purple colour. Also, the flowers made from blue paper will remain blue when the weather is going to be wet, but when it is going to be dry they will turn to green. This floral barometer is fairly reliable,

and is more reliable than many expensive instruments to foretell the weather. The paper bouquet, when coated with the solution of chloride of cobalt, as we have described, becomes what is called by scientific men a *hygrometer*, which means measurer of moisture, and which comes from two Greek words—*hygros*, moist, and *metros*, a measure. A bit of seaweed fresh from the sea forms a very good hygrometer. This is crisp and dry in warm weather, and moist and clammy in wet weather. This is caused by the salt that remains on it, the salt takes in moisture from the air when the air is moist, and, when the air is dry, so is the seaweed and the salt. If our senses were keen enough we could tell when the air is moist or dry, but our senses are not nearly keen enough to detect little changes, and careful students of chemistry and of Nature have found out that the effect upon other objects, such as salt seaweed, is much greater than it is upon men and women and boys and girls, so that by studying seaweed and other things we can tell what changes the air is undergoing, and so can tell what kind of weather we are going to have.

If we are thinking of planting a strawberry bed, the soil must be made ready. We must dig it deep and put in some well-rotted manure, and after that it is as well to tread it. Half the secret of getting the plants to take quickly to the soil is to plant them firmly.

If the out-of-door tomatoes are ripening quickly now, we may pluck those that are ruddy, and finish ripening them in a sunny window, or, better still, in a greenhouse or conservatory, as near to the glass as we can get them. Of course, they must be partially coloured before we pick them. We must still keep a look-out for side growths, and remove them as soon as they appear. If the plants are bearing fruit very plentifully, it is well to feed with liquid manure well diluted with water. We need not give this every day, but only alternately with plain water.

Perhaps the vegetable marrows are now showing fine large fruits, and we must remember that there is no need to let these remain on the plants after they have reached a fair size, as the plants will be all the better without them. Young vegetable marrows, freshly picked, are a great deal nicer to eat than those that have fully matured their seeds.

## BAROMETER

and is more reliable than many expensive instruments to foretell the weather.

The paper bouquet, when coated with the solution of chloride of cobalt, as we have described, becomes what is called by scientific men a *hygrometer*, which means measurer of moisture, and which comes from two Greek words—*hygros*, moist, and *metros*, a measure. A bit of seaweed fresh from the sea forms a very good hygrometer. This is crisp and dry in warm weather, and moist and clammy in wet weather. This is caused by the salt that remains on it, the salt takes in moisture from the air when the air is moist, and, when the air is dry, so is the seaweed and the salt. If our senses were keen enough we could tell when the air is moist or dry, but our senses are not nearly keen enough to detect little changes, and careful students of chemistry and of Nature have found out that the effect upon other objects, such as salt seaweed, is much greater than it is upon men and women and boys and girls, so that by studying seaweed and other things we can tell what changes the air is undergoing, and so can tell what kind of weather we are going to have.





# THE CHILD'S STORY OF FAMOUS BOOKS

"What is thy name, lad?"

"John Halifax"

"Where dost thee come from?"

"Cornwall"

"Hast thee any parents living?"

The lad replied that he had not, and to many other questions with which Mr Fletcher plied him he returned straightforward answers. The tanner promised him a groat if he would see Phineas safely home when the rain had ceased, and asked him if he would care to take the piece of silver now

**THE LITTLE GIRL WHO CUT A SLICE OF BREAD FOR POOR JOHN HALIFAX**

"Not till I've earned it, sir," said the Cornish lad. So Mr Fletcher slipped the money into his son's hand and left them. Only a few words were spoken between the two boys for a little while after he went away, and John Halifax stood idly looking across the narrow street at the mayor's house, with its steps and porticoes and its fourteen windows, one of which was open, showing a cluster of little heads within. The mayor's children seemed to be amused, watching the shivering shelterers in the alley, but presently a somewhat older child appeared among them, and then went away from the window quickly. Soon afterwards a front door was partly opened by someone whom another was endeavouring to restrain, as the boys on the other side of the street could hear loud words from behind the door.

"I will! I say I will——"

"You sha'n't, Miss Ursula!"

"But I will!" And there stood the little girl, with a loaf in one hand and a carving-knife in the other. She succeeded in cutting off a large slice. "Take it, poor boy! You look so hungry," she said. "Do take it!" But the door was shut again upon a sharp cry of pain, the headstrong little girl had cut her wrist with the knife.

**THE BEGINNING OF GOOD FORTUNE AND HAPPINESS FOR THE WANDERING BOY**

After a little, John Halifax, who was clearly famished for want of food, went across the street and picked up the slice of bread which had fallen on the doorstep. In those days poor folk rarely tasted wheaten bread at all, and probably the Cornish lad had not eaten a morsel of it for months. He now ate the slice very slowly, and

looked very thoughtful all the while. This was the beginning of all that made for happiness and good fortune in the life of John Halifax, as we shall discover in due time.

From the moment Phineas had set eyes on him he liked the lad; and as he lived a very lonely life, with no playfellows and no friends of his own age, he longed to be friends with this strong-looking, honest youth who had so suddenly come into his life. John had been so tender in the way he had helped Phineas home that the Quaker boy felt sure he would be a worthy friend.

It appeared that John had heard of his father as a sad, solemn sort of man, much given to reading. He had been described to John as "a scholar and a gentleman," and the lad had determined that he, too, would be a scholar and a gentleman. He was only an infant when his father died, and his mother, who had been left very poor, had a sore struggle until she died, when John was only eleven years old. Since then the lonely boy had been wandering about the country getting odd work to do at farms, and other times almost starving.

**JOHN HALIFAX DETERMINES TO BE A GENTLEMAN LIKE HIS FATHER**

Thus had he wandered to Norton Bury, and now, thanks to Phineas, Mr Fletcher gave him a job at the tannery, although at first he was not altogether sure of John's character.

It was not long, however, before the two lads were fast friends, and spent much of their time together. John Halifax could read, but he had not yet learnt to write, so Phineas, who had been well educated, became his friendly tutor, and repaid his devotion by teaching him all he knew.

One day John took from his pocket a little case of leather, with an inner one of black silk, which enclosed a book. This was the one treasure he had carried about with him since his mother's death; and he would not let it go out of his hand, but held it so that Phineas could see the leaves. It was a Greek Testament, on the fly-leaf of which was written, after the old English fashion.

"Guy Halifax, his book"

"Guy Halifax, gentleman. Married Muriel Joyce, spinster, May 17, in the year of our Lord 1779"



Henry March had left his daughter, though he had intended to appoint another guardian to look after her.

John was very sad at the thought of Ursula leaving the cottage for the squire's home at Mythe House, for he knew that she had been happier there in the sweet country retreat than she would ever be in the ill-conducted household of her guardian. She, too, had regrets at the thought of going, as John and she had been such fast friends.

**JOHN HALIFAX TELLS URSULA THAT HE IS ONLY A TANNER'S APPRENTICE**

John told her that Mr Brithwood would probably deny his right to be considered a friend of hers, and would not allow his claim to be thought a gentleman, even though a poor one. In answer to her expression of astonishment, he said.

"It is right, Miss March, that you should know who and what I am to whom you are giving the honour of your kindness. Perhaps you ought to have known before, but here at Enderley we seem to be equals—friends."

"I have indeed felt it so."

"Then you will the sooner pardon my not telling you—what you never asked, and I was only too ready to forget—that we are *not* equals—that is, society would not regard us as such, and I doubt if even you yourself would wish us to be friends."

"Why not?"

"Because you are a gentlewoman, and I am a tradesman."

The news was evidently a shock to her. It could not but be reared as she had been. She sat—the eyelashes dropping over her flushed cheeks—perfectly silent. John's voice grew firmer, prouder; there was no hesitation now.

**THE LITTLE GIRL WHO GAVE JOHN HALIFAX BREAD WHEN HE WAS STARVING**

"My calling is, as you will soon hear at Norton Bury, that of a tanner. I am apprentice to Abel Fletcher, Phineas's father."

"Mr Fletcher!" She looked up at him, with a mingled look of kindness and pain.

"Ay, Phineas is a little less beneath your notice than I am. He is rich, and has been well educated, I have had to educate myself. I came to Norton Bury six years ago—a beggar-boy.

No, not quite so bad as that, for I never begged. I either worked or starved."

The earnestness, the passion of his tone, made Miss March lift her eyes, but they fell again.

"Yes, Phineas found me starving in an alley. We stood in the rain opposite the mayor's house. A little girl—you know her, Miss March—came to the door and threw out to me a bit of bread."

Now indeed she started.

"You! Was that you?"

"It was I."

John paused, and his whole manner changed into softness as he resumed.

"I never forgot that little girl. Many a time, when I was inclined to do wrong, she kept me right—the remembrance of her sweet face and her kindness."

That face was pressed down against the sofa where she sat. Miss March was all but weeping.

John continued.

"I am glad to have met her again, and glad to have been able to do her some small good in return for the infinite good she once did me. I shall bid her farewell now, at once, and altogether."

A quick, involuntary turn of the hidden face seemed to ask him "Why?"

**THE ILLNESS OF JOHN HALIFAX AND A DREAM THAT CAME TRUE**

"Because," John answered, "the world says we are not equals, and it would be neither for Miss March's honour nor mine did I try to force upon it the truth—which I may prove openly one day—that we *are* equals."

Miss March looked up at him—it were hard to say with what expression, of pleasure, of pride, or simple astonishment, perhaps a mingling of all, then her eyelids fell. She silently offered her hand, first to Phineas, and then to John. John pressed it, and rose. His hand was on the door, but he could not go.

"Miss March," he said, "perhaps I may never see you again—at least, never as now. Let me look once more at that wrist which was hurt."

Her left arm was hanging over the sofa, the scar being visible enough. John took the hand, and held it firmly.

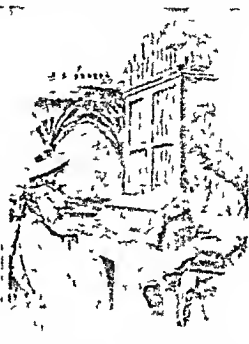
"Poor little hand—blessed little hand! May God bless it evermore!"

Suddenly he pressed his lips to the place where the wound had been, a kiss long and close, such as only a lover's.

SCENES FROM JOHN HALIFAX, GENTLEMAN



Job 11 was and is wonderful. It is a big letter  
and I married her I will be with her  
knows good for the time and after his leaving



Young said he met a man on 6th Avenue  
about 11:30 p.m. who told him that he had  
died in the Hall during the fire.



Just step 1 to make plans for the future is to get a  
thorough background check. This is not a bad idea. The  
last one I saw was from 2000. It's not a bad idea.

[illegible]

kiss could be Surely she must have felt it—known it A moment afterwards he was gone That day Miss March departed, and John and Phineas remained at Enderley alone

After John Halifax had returned to Norton Bury he was seized with fever, and for a time it looked as if he might not recover In his delirium he called aloud for Ursula, and dreamed that she had come to sit with him, asking him to live for her sake Phineas, in his anxiety for his friend, brought Ursula to him, and the dream came true, for she did ask him to live for her sake He recovered at length, and became Mr Fletcher's partner

Going to London on behalf of the business, John there met the great statesman, Mr Pitt, who was impressed with the natural abilities of the young man. His reputation for honesty and sound common-sense had now grown so great in Norton Bury, that when he returned there he found himself one of the most respected men in the town

#### THE MARRIAGE OF JOHN AND URSULA AND THE FORTUNE DENIED THEM

Although he was still far from being rich, he was no longer a poor worker, and as Ursula was willing to share his life, they boldly determined to be married, in spite of her guardians, who asserted that John would never touch a penny of Ursula's fortune They contrived, however, to be happy without it, for John refused to go to law to recover his wife's money, and was determined he would work honestly to support her Lady Caroline would have been friends with them, but he wished to have nothing to do with her, or the class of people who were her associates

With the death of old Mr Fletcher, however, came misfortune, for it was found that the tannery was no longer a paying property, and there were only the mills to go on with The temptation now was strong, in the face of his difficulties, for John to claim his wife's fortune, illegally held by Squire Brithwood But he resisted it, and determined to struggle on

At this time Ursula's relative, Lord Luxmore, who was anxious to see the Catholic Emancipation Bill passed, thought he could use John Halifax for his purpose by offering to get him

returned to Parliament for the "rotten borough" of Kingswell, the member for which was then elected by only fifteen voters Twelve of these were tenants of Lord Luxmore, and the other three of Phineas. But although John would have supported the Bill, he was too honest to let himself be elected to such a seat, as all honest men were then agitating to abolish these "rotten boroughs"

#### JOHN-HALIFAX'S HONESTY IS PUT TO THE TEST AND FOUND TRUE

So he declined, and Luxmore next tried to win him over by offering him the lease of some important cloth-mills he owned, but these he would not take on credit, and he had no money to pay for them So Ursula now determined to tell his lordship all about the way her fortune had been kept from them, and the result was that Lord Luxmore went to Brithwood and made him turn over the money to her. When John purchased the lease of the mills, his lordship thought he had secured him firmly, and that John would use his great and growing influence with the people of the district to further Luxmore's political schemes

While all this was going on, young Lord Ravenel, the son and heir of Luxmore, had been a constant visitor at the Halifax home, and delighted in the company of John's daughter, Muriel. Halifax had now three children, two boys, named Guy and Edmund, and Muriel, who, alas! had been born blind Perhaps on account of her infirmity she had been the pet of her parents, but she was of a gentle and affectionate nature, and was also beautiful to look upon, even with her sightless eyes Young Ravenel was also a gentle youth, and, like Muriel, was fond of music

#### THE INDEPENDENCE OF JOHN HALIFAX AND HOW HE MET OPPOSITION

The time for the election of the member for Kingswell had now come round, and as Luxmore had failed to induce John Halifax to stand, he put up another person, who would do just as his lordship wanted But he was greatly mistaken in supposing that John would use his influence to make the handful of voters, most of whom were employed in his mills, vote for Luxmore's man Instead of that, Halifax advised them to be honest, and vote as they thought right, with the result



housekeeping where John and Ursula had begun before them.

Soon after this, Lord Ravenel sought to be regarded as suitor for the hand of Maud, who would thus have become the future Countess of Luxmore. He said that he would wait two years for her, if her father wished it, but John Halifax would make him no promise, and urged him rather to endeavour first to become a more worthy man, so that he might do something to redeem the evil reputation which the conduct of his own father had brought upon the name of Luxmore.

"Do you recognise what you were born to be?" said Halifax to him. "Not only a nobleman, but a gentleman, not only a gentleman, but a man—man made in the image of God. Would to Heaven that any poor word of mine could make you feel all that you are—and all that you might be!"

THE YEARS PASS BY AND THERE IS HAPPY NEWS OF GUY HALIFAX

"You mean, Mr. Halifax, what I might have been—now it is too late."

"There is no such word as 'too late' in the wide world—nay, not in the universe," said John Halifax.

Lord Ravenel for a time sat silent, then with a sudden effort he rose to go, and, thanking Mrs. Halifax for all her kindness, he said, in a voice choked with emotion

"For your husband, I owe him more than kindness, as perhaps I may prove some day, if not, try to believe the best of me you can. Good-bye!"

It was not many weeks after this that the old Earl of Luxmore died in France, and it then became known that his son, who now succeeded to the title, had voluntarily given up his claims on the estate in order to pay the heavy debts of his worthless father.

The home at Beechwood had lost another inmate, when Guy, first going to Paris, had later sailed for America. Years passed by, and he became a successful merchant in Boston, and then one day he wrote home to say he was coming back to the Old Country to be with his father and mother again, and was bringing with him the partner in his business.

The ship in which Guy and his friend sailed from America was wrecked, and Ursula, in her grief at the supposed loss

of her eldest son, seemed to be wearing away, when one day a strange gentleman stood in the doorway—tall, brown, and bearded—and asked to see Miss Halifax. Maud just glanced at him, then rose, and said somewhat coldly:

"Will you be seated?"

"Maud, don't you know me? Where is my mother?"

The return of the son whom she had given up for dead brought joy again to the heart of Ursula, and her health seemed to revive, but it was clear that her days were now uncertain.

YOUNG LORD RAVENEL PROVES THAT JOHN HALIFAX WAS RIGHT

Scarcely less than the delight in Guy's return was the discovery that his partner was none other than the new Earl of Luxmore, who, as plain Mr. William Ravenel, had by his life in America proved John Halifax was right when he said it was not too late for him to model his life on lines of true manliness. He had, indeed, become all that John had desired of him—a man and a gentleman—so that Maud was, after all, to be the Countess of Luxmore.

But the days of John Halifax himself were now drawing to a close, and he was not without premonitions of his end, for in his talks with Phineas Fletcher, who had remained his faithful companion all these years, he spoke as one would speak of a new abode, an impending journey. Death came to him very gently one day at sunset, just after he had smiled to Phineas, when his old friend, looking towards Lord Luxmore and his future bride, who were with a group of the young people, had said.

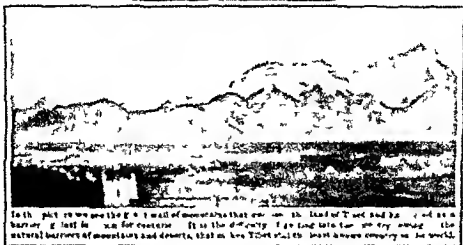
"I think sometimes, John, that William and Maud will be the happiest of all the children."

THE PEACEFUL END OF A NOBLE AND BEAUTIFUL LIFE

He smiled at this, and a little later seemed to be asleep; but when Maud came up and spoke to him, he was dead. While he was sleeping thus, the Master had called him. His sudden end was so great a shock to the frail life of Ursula, that when they buried John Halifax in the pretty Enderley churchyard they laid to rest with him his wife of three-and-thirty years, who had been a widow but for a few hours.

The next Famous Books are on page 4017.

# The Child's Book of ALL COUNTRIES



In this picture we see the great wall of mountains that enclose the land of Tibet and stand as a barrier of land for centuries. It is the difficulty of going into the country among the natural barriers of mountains and deserts, that makes Tibet such the most obscure country in the world.

## THE HEART OF ASIA TIBET, TURKESSTAN, MONGOLIA & AFGHANISTAN





plateau, which in turn is crossed by the Altai Mountains, south of Siberia. From the south-west of the Pamir Plateau the ranges of the Hindu Kush cross Afghanistan. These, and the western outlying mountains of the Pamirs run on to form the northern boundary of the Persian desert, and join the Elburz Mountains south of the Caspian Sea. Many shorter ranges, such as the Karakorum—whose greatest heights are known to tower above the Himalayas—and the Sulaiman, gather like buttresses round the "Roof of the World."

#### THE WHITE MOUNTAIN PEAKS THAT LOOK DOWN UPON CENTRAL ASIA

If we could but look down from above on these giant mountain walls—the framework of Central Asia—what a scene of extraordinary beauty and desolation would meet our eyes! Nearest us would be the dazzling white of the snowy peaks, for most of the mountains of Central Asia are far above the line of perpetual snow, surrounded by glaciers and ice-fields, all of immense size. In contrast with all this would be the dark, bare pinnacles of rock, the fearsome precipices and cliffs, girdled lower down by dark forests and rushing streams. From these, grassy slopes stretch downwards, covered with lighter vegetation, and relieved in places with masses of crimson rhododendrons and other Alpine flowers.

Between these mountain walls, which act as barriers to the moisture in the air, to plants and animals, and to races of men, lie the countries that make up Central Asia. For the greater part these countries can be filled in, in our broad picture, with a tone of brownish yellow, relieved here and there by splashes and long streaks of green. This vivid green vegetation often connects the dark green foliage of the mountain forests and the grassy slopes with the vast extent of yellow desert below.

#### THE LITTLE KNOWN LAND STANDING THREE MILES ABOVE THE SEA-LEVEL

Let us now find these countries upon the map. On the east of the Pamirs is the high tableland of Tibet, between the Himalayas and the Kwen Lun Mountains. Tibet is eleven times as large as England and Wales, and most of its surface, like the Pamir Plateau, is three miles above the level of the sea, with many peaks rising higher still.

Eastern Turkestan, more than twice the size of Germany, lies between the Kwen Lun and the Thian Shan Mountains; a great deal of it is in the basin of the Tarim River, shut in by immense deserts.

The vast upland of Mongolia, of about the same area as Arabia, lies beyond the Thian Shan Mountains, and is bounded by Siberia and Manchuria. All these three countries of Central Asia have long been practically part of the vast Empire of China.

It is Afghanistan and British India that are chiefly concerned in the important passes to the south-west of the central plateau in the Hindu Kush and Sulaiman ranges. The fourth of the Powers whose dominions meet on the Pamirs is Russia. Two great rivers, the Syr Daria and the Amu Daria—Daria is the Persian word for river—flow from the heights of the Thian Shan and the Pamirs over the plain of Western Turkestan to the inland sea of Aral. Russian Central Asia stretches over these valleys from the Pamirs to Siberia, from the Caspian to the borders of Eastern Turkestan, nearly twenty-six times the area of England and Wales.

#### WANDERING TRIBES & FERTILE VALLEYS IN THE GREAT DESERTS OF ASIA

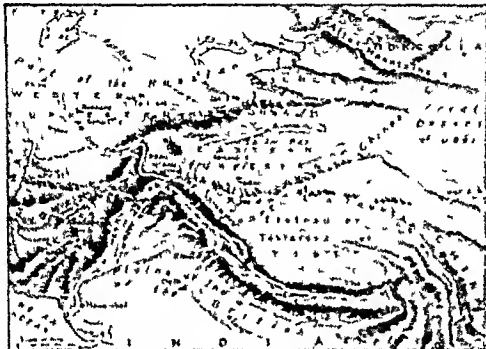
We read in the story of Russia that begins on page 3745 how much of this vast country is desert, and how much consists of grassy steppes on which wandering tribes, such as the Kirghiz and Turcomans, raise immense flocks and herds. We may at the same time glance at the fertile oases and river valleys, with their fine crops of fruit, vegetables, grain, and cotton for the mills of Moscow and Warsaw. In parts of West Turkestan coal is found to be abundant, and it will be of great use as fuel for the railways and river and lake steamers of the district if ever the supply of petroleum refuse from Baku, which is now used, should fail.

Russian enterprise has brought the railway from the Caspian to the foot of the Thian Shan Mountains, linking together the towns situated on the oases and in the fertile valleys. One likes to think what the impetuous Tamerlane, who made his headquarters at Samarkand, would have thought of this rapid means of transit. A branch line is being made from Merv, the last

stronghold of the warlike Turcoman tribes subdued by Russia in the middle of the last century toward the Afghan frontier near Herat to meet in course of time the British railway that is being made from India through the Bolan Pass, of which there is a picture on page 169.

Thus far into the heart of Asia the shriek and shout of the iron horse wakes the solitude and opens up possibilities of trade and travel on routes

are covered by forests. The great Desert of Gobi treeless and white less about 2000 miles long lies in its midst and in the north-west the offshoots of the Altai Mountain give rise to many rivers that make fertile valleys. The greater number of the people (Mongols) are shepherds and use their goat flocks and herds as their ancestors have done for time immemorial and living much the same life that they have done through centuries. Pithi Wang



Map of Central Asia, showing the Gobi Desert, the Altai Mountains, and the Amu Darya and Syr Darya rivers. The map is labeled with various geographical features and names in English, including 'Gobi Desert', 'Altai Mountains', 'Amu Darya', and 'Syr Darya'. It also shows the borders of Russia, China, and Persia.

the "Land of Grass," a few centuries after Attila. We know how strongly they influenced the history of Western Asia and of Europe. We also know how soon the Turks adopted Mohammedanism when they came in contact with it. This religion simple and direct when it was first taught, has ever appealed strongly to the wandering tribes of Central Asia, most of whom, to this day, observe its customs and devoutly say their prayers facing towards Mecca.

All through the early centuries advances were constantly made on Central Asia by the neighbouring and ancient Empire of China partly owing to the use of trade, and partly through wars, in which sometimes the Mongols had the best of it and sometimes the Chinese.

When Jenghiz Khan the "Perfect Warrior," arose early in the thirteenth century to lead his Mongols, he conquered not only the rest of Central Asia, but Persia and China too, though it was not till a century later that Mongol emperors were firmly established in China, where they ruled for a period of 200 years. After this the Mongols were driven out of China, and Mongolia then became a Chinese province.

## THE CONQUERING HORDES OF TARTAR WARRIORS THAT SWEEP ACROSS ASIA

In the story of Russia we may read of the arrival of the Golden Horde of Mongolian Tartars, on the north of the Black Sea, also of the arrival of succeeding hordes as the years went on, and how strongly their influence stamped itself on the country for 300 years. We know, too, how Timur, or Tamerlane, first with his destroying armies over Persia and India, and then far away to the Minor, where he arrested for a time the power of the Ottoman Turks. The fall of the great Mogul power in India, the days of the Tudors and Stuarts, old on page 1698.

At the same time that these fierce hordes were setting fire to all the world in their reach, and in many cases making their steps after two or three hundred years towards their original abode, the old life on the steppes and deserts was still going on. The great caravans were plodding along the trade routes, with but temporary delay, carrying the silk from

China, the precious jade stone from South Turkestan, the beautiful carpets, and soft hangings, and all the other treasures and riches of the East which made it seem a perfect wonderland to Western minds.

But the Westerners, as we shall see later, for many hundreds of years had no chance of travelling and exploring in the wide regions of Central Asia, as these regions fell more completely under the power of the Chinese Empire.

## A MIGHTY RIVER THAT HAS NO MOUTH AND NEVER REACHES THE SEA

The two important towns of Kashgar and Yarkand, on the trade routes from China to India and Russia, lie at the western end of Eastern or Chinese Turkestan, where the streams come down from the heights of the Pamirs and make some cultivation possible in this wide and desert country.

The great Swedish explorer, Sven Hedin, has spent much time in Chinese Turkestan, and to him we owe nearly all that is certainly known of the great River Tarim and its tributaries. Making his way over the outlying mountains of the Pamirs from the railway terminus of the Trans-Caspian line, he arrived at Kashgar while a great fair was going on. He soon pushed on to a town on the upper part of the river, and, after collecting native boatmen and stores and adapting a sort of house-boat, he started on his wonderful journey on the Tarim, a river as long as the Danube. Unlike the Danube and other rivers, the Tarim has no mouth and never reaches the sea, but dwindles away, after a long and winding course across a vast expanse of thirsty sand, in a system of shallow lakes.

## A FAMOUS EXPLORER'S LONG JOURNEY ON AN ALMOST UNKNOWN RIVER

Sven Hedin spent three months in his house-boat, drifting, paddling, and sailing, making observations and mapping out the winding course, as he noted the surrounding country. On the banks of the river and its tributaries was every variety of scenery. Women and children waded out to bring melons and other food for his use from villages amid cultivated fields; groves of trees delighted his eyes, some like enchanted forests with the gorgeous red and gold of the autumn leaves, the stillness being sometimes

# FAMOUS CITIES IN THE HEART OF ASIA



A view of the city of Lhasa, Tibet, showing the Potala Palace and the surrounding mountains. The city is built on a hillside, and the Potala Palace is the most prominent building. The surrounding mountains are covered in snow, and the sky is clear.



A street scene in Lhasa, Tibet, showing people walking and a horse-drawn carriage. The street is wide and paved, and the buildings are made of stone. The people are dressed in traditional Tibetan clothing, and the horse-drawn carriage is a traditional mode of transport.



A view of a large, open field or plain in Lhasa, Tibet, showing a small building in the distance. The field is covered in grass, and the building is a small, simple structure. The sky is clear, and the overall scene is peaceful.

broken by the flight of the wild ducks and geese on their way to winter quarters. Then came long stretches of pasture land, where lonely shepherds watched their flocks and fled terrified at the sight of the strange-looking tent-boat. It was the explorer's turn to be terrified when the green eyes of the tigers that came down to the river to drink lapping like tame cats gleamed out of the darkness, and the tall reeds rustled and whistled in the breeze.

**A RIVER THAT RUNS IN A DESERT BETWEEN HIGH CLIFFS OF SAND**

All this time the sand that lay for an immeasurable distance on both sides beyond the streak of cultivation brought by the river, was out of sight. Presently, however, it pressed forward and formed high banks like cliffs between which the boat glided on her journey in dreary stillness.

The ice stopped the boat at last for when the river froze the explorer had to start on the equally exciting and more dangerous part of his journey by land. Such a loading of camels with food and ice, firewood and other necessities, and choosing of horses and asses and dogs with the help of the natives who acted as guides and companions. Day after day they wound their way for nearly 200 miles across the desert. Sand-storms, difficult climbing over the loose sand-hills, piercing cold that froze the ink in the explorer's pen, scarcity of provisions—all fell to their lot.

But many interesting facts were discovered or verified, such as the shifting of lake and river beds, the former existence of forests where nothing now grows, and, most wonderful of all, the explorer discovered that great cities, once flourished in this dry, silent waste, their remains being buried under the penetrating, ever drifting and shifting masses of sand that cover everything.

**THE JOURNEY OF A LITTLE ENGLISH BOAT OVER THE DESERT LAKES OF ASIA**

We long to linger with Sven Hedin in his adventures among the wonderful lakes in the Lob Nor district where the Tarim is finally lost. He reached this district when the spring had brought scorching heat and mosquitoes—very hard to bear in the desert solitudes. With a little canvas boat from England he paddled over the wide lakes, some gleaming with fish and wild

swans, some intensely salt and still, and bearing no sign of life whatever. But we must hurry on to cross the high passes of the north mountain wall of Tibet, some 2,000 feet higher than the tops of the highest mountains of Switzerland. Here we feel intense cold, as well as tremendously high winds, blinding snow-storms, and terribly rough paths. But the grand precipices and giant peaks are a fitting match for the southern rampart of Tibet—the glorious Himalayas.

The great Indian rivers, the Indus and the Brahmaputra, rise close together in the southern valleys of Tibet, and then flowing on, one west and the other east, break through the Himalayas in grand gorges more than a thousand miles apart on their southwards search for the sea. The most fertile part of Tibet is in the upper part of these rivers, and of others that flow eastwards to China. On the wind-swept, high plateau, dotted with lakes, the people rear vast herds of sheep and mountain goats, and yaks carry the burdens over the difficult and dangerous mountain passes.

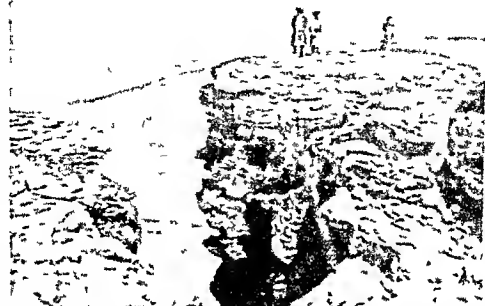
**A LAND THAT IS GUARDED BY GLITTERING RAMPARTS IN THE CLOUDS**

Tibet is one of the most extraordinary countries in the world and its history and present state is chiefly owing to its position, that of a citadel strongly guarded by glittering, icy ramparts in the clouds.

For a long time Tibet was little affected by the wars and migrations and changes that went on in the rest of Central Asia. From hunters its early people developed into herdsmen, with yaks to carry their loads, as they wandered about. Later they began to cultivate the soil where rivers made it possible, and as they became more civilised their power grew so much that they became formidable enemies even to China.

In the meantime a wonderful invasion was taking place in Tibet, and, indeed, it is the only one that has really mattered in the country's story. That ancient and wonderful religion of India, Buddhism, spread by slow degrees over Tibet, and in the course of time as its influence lessened in India, it increased in Tibet, till at last that isolated and mysterious country, of which the outer world has always known so little,

# MOUNTAIN AND PLAIN IN CENTRAL ASIA



The old Tiber which settles the old of the world and is now higher than any other in the world. The height of the whole is 17,000 feet. The old Tiber is 17,000 feet high.



The old Tiber which settles the old of the world and is now higher than any other in the world. The height of the whole is 17,000 feet. The old Tiber is 17,000 feet high.

became its chief headquarters. Naturally Tibet shared to some extent in the convulsions that shook the old empire to which it was eventually attached, but outside worldly matters seemed to pass unheeded by the Tibetans as they became more and more absorbed in their religion and its observances.

#### HOW THE BRITISH ENTERED LHASA, THE MYSTERIOUS CAPITAL OF TIBET

Many travellers have of late years returned back from its borders, for the Tibetans share the Chinese dislike of foreigners. However, a British force sent to settle some trade arrangements, succeeded in entering Lhasa, the capital, which is only 150 miles from the Himalayas. But the chief high priest, or pope, the Dalai Lama, had fled. This man rules over his docile subjects as king and god: there is no limit to his power over them. China sends two governors to look after the state and its worldly matters.

Thousands of Buddhist pilgrims from China and India wend their way to worship at the holy city of Lhasa, and to reverence the Dalai Lama. He lives a short way from Lhasa, in a mysterious and huge white palace on the crest of a hill, the centre part a blaze of crimson, the roofs of glittering gold. Who can tell of the treasures inside brought by the devout pilgrims from the rich East?

It is said that in Tibet there are 20,000 priests, or monks, in one monastery alone, near Lhasa, there are 6,000. Every family dedicates at least one son to the priesthood. Thus being the case, it is scarcely to be wondered at that the spirit of devotion to the religion of Buddha has very deeply influenced the Tibetan people, who have so little intercourse with the outside world, that holds such different opinions from their own.

#### A LAND OF MANY PRAYERS WHERE MEN WORSHIP BY MACHINERY

Religious inscriptions are seen on the rocks, houses, and temples, prayer-wheels, such as those to be seen in the Room of Religions in the British Museum, turned not only by hand, but by wind and water reel off prayers to the Deity amid the flutter of praying-wheels. When the day is ending, and the dark rocks stand out grim against the sky, all work stops, the people gather in the squares and open places, and, prostrating themselves on the earth,

chant the evening prayers. Very different has been the story of Afghanistan on the other side of the Pamirs. Through the Kharbar Pass, thirty-three miles long, and in parts only ten to seventy feet wide most conquerors have marched to the rich plains of India and many have been the fights and struggles about other passes and the chief towns—all keys to India—as well as stations on the old caravan routes to French Indo-China and Persia.

Afghanistan has had its share in all the devastations and conquests of the centuries, for Arabs and Turks and Mongols have swept across it in turn. For a time as we know, it ruled both in Persia and India, then its power ebbed again, but the hardy mountaineers became independent once more in the middle of the eighteenth century.

The British have bitter memories connected with many of the towns and passes. In 1842, a British army of 14,500 men left Kabul to retreat to India through the snowy passes which it commands. One man alone survived the constant attacks of the Afghans and the hardships of the way, and stumbled into Jellalabad on his exhausted pony, fainting, and hardly able to tell of the disaster and the fate of his companions.

#### THE FAMOUS MARCH OF LORD ROBERTS FROM KABUL TO KANDAHAR

In August, 1880, Lord Roberts made his famous march in twenty-two days from Kabul to Kandahar to restore order after the risings and losses following the settlement of the frontier boundaries.

If we turn to page 34, we can read the story of Marco Polo, the Venetian boy of fifteen, who walked to China in the thirteenth century. He was twenty-one when he reached the end of his journey. It will interest us to trace his route, for we, too, have crossed Syria to Mesopotamia and Baghdad, and found our way to the Persian Gulf. We have wandered, too, round the mountains and deserts of Central Asia. After a stay at Ormuz, finding it impossible to go on by sea, the boy, with his father and uncle, went north through Persia and Afghanistan.

Here the party had to rest awhile on account of Marco's illness; he greatly enjoyed the fine mountain air and scent of the pine-groves as he was getting better. Then, by the upper courses of the Amu Daria, formerly called the

# THE PEOPLE WHO LIVE IN CENTRAL ASIA



The great turban is of gold and silver, the other ornaments are of silver. There is a w. city Margat g. Chen k.



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Oxus, the party pushed up to the Pamir Plateau itself, and then descended on Kashgar, Yarkand, and Khotan. The Tarim basin was next crossed to Lob Nor. Finally, by the route to the north of China, the city of Peking was reached at last. These regions were closed to foreigners soon after this wonderful journey, and they were not described again by Europeans until six hundred years had elapsed.

We have found much to think over while looking at the map of the heart of Asia, and while following the footsteps of the brave travellers who have faced its mysteries and dangers in order to show its wonders to their fellow-men

secrets, and of the languages spoken by her children, are all helping to find it. They say that perhaps, once upon a time, a great and restless open sea glittered in the sunshine, or raged in stormy might where the vast plains of Siberia now lie in swamps, slowly draining, with great salt inland lakes, such as the Caspian and Aral, that were left behind when the rising land pushed the ocean ever farther and farther north. The woolly mammoths imprisoned in the ice tell of mighty and overwhelming changes such as these. So, perhaps, what is now the dry and sandy heart of Asia was once a forest-covered seaside land, tempered by



This strange scene is to be witnessed at the beginning of spring all over the land of Tibet. The country is full of monasteries, and at the great religious festival of spring the lamas, or monks, wear strange and hideous masks, in striking contrast to their gorgeous silk robes. The monastery shown in this picture is the famous one at Hims.

We have realised, too, whence came the streams of conquerors into Europe—the conquerors whose names and deeds and personal appearance are familiar to us. And yet there are many questions we should like to ask.

What of that dim host that, in the distant past, spread over India and Europe and left traces of their ways of life, and of their thoughts, in words that have been handed down through countless generations? Where was their first home, and why did they leave it? No one yet knows fully the answer to this question, though explorers and lovers of the study of Mother Earth's

refreshing breezes that brought rain and moisture to a country that was not nearly so high as the "Roof of the World" is now. For when the bed of the northern ocean rose, the mountains and plateaus may have been pushed up, too, so that river basins and courses were completely altered, and the climate, instead of being pleasant and temperate, became one of great extremes in heat and cold.

Perhaps it was changes such as these that may have driven the early peoples of what is now Central Asia to the plains of India and ever farther across Eurasia towards the lands of the setting sun.

The next story of Countries is on page 4035.

# The Child's Story of THE EARTH



The most familiar barometer is the aneroid barometer. The first picture shows how it works, and the second shows how it works. The air gets set down with pressure or is a force upon the air from which all the air has been taken, and the mercury rises or falls.

## THE PRESSURE OF THE AIR

We are all aware

that there are

many different kinds

of pressure. For instance, we

resist what it is to press with

the feet, a hand, anything, and

whenever we use the word

pressure, that is the kind of

idea we may have in our minds.

When we say anything is the case, we

feel its pressure due to gravitation,

and that is a kind of pressure which we

know well as hydrostatic pressure, equally

to all the different states of matter.

We know, however, that we also

know that there is another kind of

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for our lives, and we must spend a little time in studying it carefully. We know that we really live at the bottom of a great ocean of air. On the floor of this ocean we live and crawl about, and if we can swim in it for a little while at a small height—as we do in flying machines—we are very proud of ourselves.

#### HOW THE AIR PASSES INTO OUR LUNGS AND ENABLES US TO LIVE

Everywhere in this immense ocean there is fluid pressure. Perhaps the first and most important consequence of this fluid pressure is that it enables us to breathe. What happens when we breathe is that we make a movement which tends to empty the space in our lungs of everything, but as that space is in communication with the outer air, the atmospheric pressure drives some of that outer air into the space we make. Thus, without the atmospheric pressure we could not breathe, and, therefore could not live.

Now, it is only some three hundred years ago since, in studying a case like this, men said that the reason why air or anything else would rush into an empty space, if it could, was that Nature objected to anything being empty. The phrase which they used, and which they accepted as an explanation, was *Nature abhors a vacuum*—vacuum being simply the Latin for an empty place. But, just about three centuries ago, it was discovered why Nature abhors a vacuum, and also to what extent Nature abhors a vacuum. It was found that what really happens is always the consequence of fluid pressure. We owe this great discovery not directly to Galileo himself, but to another Italian named Torricelli, the most famous of Galileo's pupils.

We all know that it is possible by means of a pump to pull up water, and it was found that there was a certain height to which water would rise in a pump—about thirty feet.

#### A FAMOUS ITALIAN WHO DISCOVERED THE GREAT SECRET OF THE ATMOSPHERE

But no pump will make water rise, say, fifty feet. Thus it was remarked that there is a limit to Nature's dislike of a vacuum. Torricelli thought that other fluids would behave as water does. He thought, also, that the water rises in a pump because of the pressure of the atmosphere, and that if he took

a much heavier fluid than water, it also would rise, but, being heavier, would rise so much less. He took the heaviest of all fluids, which is mercury, and he proved that the mercury does rise in the same way as water does, but to a much lower height in proportion, as mercury is heavier than water.

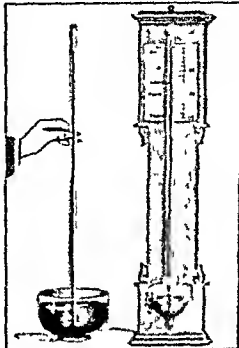
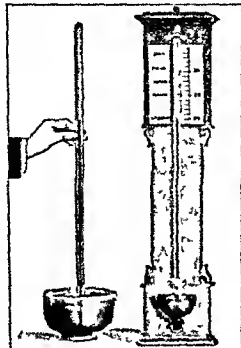
It is very easy to understand the famous experiment of Torricelli, which proved, for the first time, the existence of the atmospheric pressure, and explained why it is that Nature abhors a vacuum. If we take a fine glass tube and fill it with mercury, and then turn it upside down in a cup that already contains mercury, what will happen to the mercury inside the tube? We might expect that all the mercury would run out of the tube into the cup, but, in point of fact, it does not. Something holds up the column of mercury in the tube. The earth, we know, is pulling by gravitation upon that column of mercury. What is the opposing force that holds it up? The answer is that it is the atmospheric pressure pressing down upon the surface of the mercury in the cup, and, so to speak, pressing some of it up into the glass tube.

#### THE PRESSURE OF AIR THAT WILL BALANCE A COLUMN OF METAL

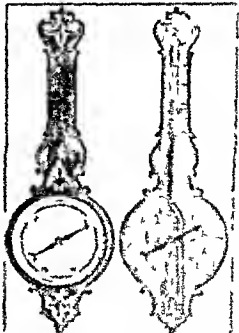
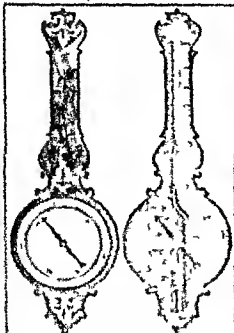
Now, if the tube is short, the mercury will fill it, but if we use a long tube, say, three feet long, and if, having filled it with mercury, we turn it upside down in a cup of mercury, the column of mercury will not be completely held up. On the average, the mercury will drop about six inches. In other words, the pressure of the atmosphere is, as a rule, about equal to supporting a column of mercury thirty inches high.

It is interesting to ask what fills the space in the tube above the level of the mercury when the mercury drops. There cannot be any air there, and we might suppose that there must be nothing there—that it must really be a genuine vacuum. In point of fact, it is as nearly a perfect vacuum as we can obtain, and it has been known, since the time we are speaking of, as a Torricellian vacuum, but it is not perfectly empty, for liquid mercury very easily turns itself into a gas, or vapour, and so, though there is no air in a Torricellian vacuum, it contains a certain amount of the vapour of mercury. It is in some

# HOW THE BAROMETER TELLS THE WEATHER



Torricelli, an Italian, discovered the pressure of the atmosphere. These pictures show how he discovered how it is related to the air around us. A column of mercury is supported in it by the weight of the air. The air in the tube is pushed up by the pressure of the air on the mercury in the pan. When the air is light, the mercury is high in the tube (as in the first picture), but the pressure of heavy air drives the mercury high up, as in the second picture.



The aneroid barometer is a small, portable instrument for measuring air pressure. It is used in many places where a mercury barometer is not practical. The needle on the dial moves up and down as the air pressure changes. When the air is light, the needle points to a high number. When the air is heavy, the needle points to a low number.

degree possible, by various means, to prevent the mercury from evaporating much, and so we can get in such a tube the nearest approach to empty space that is possible for us, although we may just remind ourselves that, however empty of ordinary matter we make this space, the ether, that fills all space, will even be there.

#### HOW WE ARE ABLE TO MEASURE THE PRESSURE OF THE ATMOSPHERE

Now, we have noticed that it is possible to measure the length of a column of mercury in one of these tubes, and so, if the atmospheric pressure were greater or less one day than the next, we ought to notice that the column of mercury in the tube is of a different length on the two days. If the atmospheric pressure is high, strong and pressing down more firmly on the surface of the mercury in the vessel then it ought to be able to hold up a longer column of mercury, and if the atmospheric pressure is low, it will not hold up such a long column of mercury.

When we think of a man pressing down with his fist on a table, or think of the game people sometimes play at fairs when a man strikes with a hammer upon a knob, and the harder he strikes the higher a weight runs up a pole, we realise what happens in the case of the column of mercury. Thus, this experiment of Torricelli's not only proves the existence of the atmospheric pressure, but it also enables us to measure it.

But, apart from such changes as may occur owing to something happening in the atmosphere, we ought to be able to show that if we rise high up in the atmosphere, the column of mercury in the tube falls, because the higher we rise, the less is the weight of air above us, and the less must be the atmospheric pressure. In the same way the pressure of water increases as we go downwards into the sea, as every diver knows.

#### WHAT HAPPENED ONE DAY TO A TUBE OF MERCURY ON A MOUNTAIN

A still more famous man than Torricelli, the great French thinker Pascal, made this experiment very shortly after Torricelli's work was begun. He took one of Torricelli's tubes up to a considerable height, and found when he got there that the level of the mercury was much lower than it had been. As he came

down again he watched the mercury, and found that its level rose, because there was now a greater pressure of the atmosphere upon the surface of the mercury contained in the vessel. The variation of the atmospheric pressure at different heights has many interesting results. For instance, when men go up in a balloon, they feel the consequences of the steady lessening of the pressure upon which breathing depends, and they may suffer very severely. There is a thing called mountain sickness, which might also be called balloon sickness, and which depends upon this lessening of the atmospheric pressure. A good many people sleep badly at low pressures of the atmosphere—that is to say, when they go among the mountains—and do better at the sea, where, of course, the pressure of the atmosphere is as high as it can be.

It has lately been proved, also by an Italian—and that is quite appropriate—that when people have lived for a few days at some great height, the body produces a greatly increased number of red blood cells—those which carry oxygen from the lungs to the tissues.

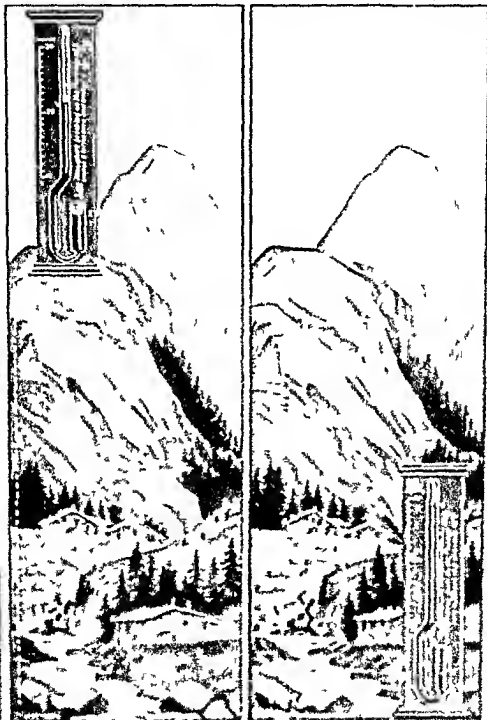
#### THE WONDERFUL WAY IN WHICH OUR BODY FITS ITSELF TO AIR PRESSURE

On a mountain-top the air is so rare, as we say, or the atmospheric pressure so low, that the body must make special arrangements accordingly. It is very wonderful indeed that the body can adapt itself in this fashion to the altered conditions of the atmosphere.

Now, if in a Torricelli tube we have a means of measuring the pressure of the atmosphere, we have what we may call a barometer, which really means a weight measurer and that is why it was said just now that there is one kind of fluid pressure which we have all of us measured many times. Every time we have looked at the barometer we have really been measuring the pressure of the atmosphere, for that is all that the barometer does.

No doubt our ordinary way of reading the barometer rather hides what we are really doing. We simply look to see if a little pointer is pointing to "Set fair" or to "Changeable," and we look on the barometer as a thing that prophesies the kind of weather that we are going to have. As a matter of fact, however, it does nothing but measure the atmospheric

# MEASURING A MOUNTAIN WITH AIR



The height of a mountain can be measured by the difference in the height of the barometer at the top and at the bottom. The barometer at the top is lower than the barometer at the bottom because the air is thinner at the top. The difference in the height of the barometer is called the barometric height. The barometric height can be used to find the height of a mountain.

degree possible, by various means, to prevent the mercury from evaporating much, and so we can get in such a tube the nearest approach to empty space that is possible for us, although we may just remind ourselves that, however empty of ordinary matter we make this space the ether, that fills all space, will even be there.

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Now, we have noticed that it is possible to measure the length of a column of mercury in one of these tubes, and so, if the atmospheric pressure were greater or less one day than the next, we ought to notice that the column of mercury in the tube is of a different length on the two days. If the atmospheric pressure is high, strong, and pressing down more firmly on the surface of the mercury in the vessel, then it ought to be able to hold up a longer column of mercury, and if the atmospheric pressure is low, it will not hold up such a long column of mercury.

When we think of a man pressing down with his fist on a table, or think of the game people sometimes play at fairs when a man strikes with a hammer upon a knob, and the harder he strikes the higher a weight runs up a pole, we realise what happens in the case of the column of mercury. Thus, this experiment of Torricelli's not only proves the existence of the atmospheric pressure, but it also enables us to measure it.

But, apart from such changes as may occur owing to something happening in the atmosphere, we ought to be able to show that if we rise high up in the atmosphere, the column of mercury in the tube falls, because the higher we rise, the less is the weight of air above us, and the less must be the atmospheric pressure. In the same way the pressure of water increases as we go downwards into the sea, as every diver knows.

## WHAT HAPPENED ONE DAY TO A TUBE OF MERCURY ON A MOUNTAIN

A still more famous man than Torricelli, the great French thinker Pascal, made this experiment very shortly after one of Torricelli's tubes up to a considerable height, and found when he got there that the level of the mercury was much lower than it had been. As he came

down again he watched the mercury, and found that its level rose, because there was now a greater pressure of the atmosphere upon the surface of the mercury contained in the vessel. The variation of the atmospheric pressure at different heights has many interesting results. For instance, when men go up in a balloon, they feel the consequences of the steady lessening of the pressure upon which breathing depends, and they may suffer very severely. There is a thing called mountain sickness, which might also be called balloon sickness, and which depends upon this lessening of the atmospheric pressure. A good many people sleep badly at low pressures of the atmosphere—that is to say, when they go among the mountains—and do better at the sea, where, of course the pressure of the atmosphere is as high as it can be.

It has lately been proved, also by an Italian—and that is quite appropriate—that when people have lived for a few days at some great height, the body produces a greatly increased number of red blood cells—those which carry oxygen from the lungs to the tissues.

## THE WONDERFUL WAY IN WHICH OUR BODY FITS ITSELF TO AIR PRESSURE

On a mountain-top the air is so rare as we say, or the atmospheric pressure so low, that the body must make special arrangements accordingly. It is very wonderful indeed that the body can adapt itself in this fashion to the altered conditions of the atmosphere.

Now, if in a Torricelli tube we have a means of measuring the pressure of the atmosphere, we have what we may call a barometer, which really means a weight measurer, and that is why it was said just now that there is one kind of fluid pressure which we have all of us measured many times. Every time we have looked at the barometer we have really been measuring the pressure of the atmosphere, for that is all that the barometer does.

No doubt our ordinary way of reading the barometer rather hides what we are really doing. We simply look to see if a little pointer is pointing to "Set fair" or to "Changeable," and we look on the barometer as a thing that prophesies the kind of weather that we are going to have. As a matter of fact, however it does nothing but measure the atmospheric





pressure at the place and time in question. The pointer is so made as to indicate the height in inches of the column of mercury which the atmosphere will hold up then and there.

#### WHY A BAROMETER TELLS US WHAT THE WEATHER WILL BE

The relation of the barometer to the weather lies in the fact that, on the whole, the most important thing in deciding the weather is the atmospheric pressure. If the atmospheric pressure is very high at a place, there will be no disturbance there, but if it is very low, then air will be rushing towards that place from other places where the pressure is higher. That means wind and wind may mean rain. So we see where the connection between the barometer and the weather comes in, and when we find, as we sometimes do, that the barometer cannot quite be trusted as a weather-glass, we must remember that the causes of the weather are very complicated, and that the atmospheric pressure, though the most important of them, is only one of them. We have a way of giving things names according to the use we put them to, and so we may call the mercurial barometer a weather-glass but that is certainly not its proper name.

For the matter of that we might call it a mountain measurer, for, as we can now quite readily understand, this simple instrument actually gives us a way of discovering how high a mountain is. All we have to do is to find out how much the mercury falls in it for every thousand feet that we go up, and then we can reckon how high a mountain is. There is, however, one serious condition attached to this method, which is—first climb your mountain! That is often impossible; and in any case there are more accurate ways of measuring the heights of mountains than with a barometer.

#### HOW THE MERCURY IN THE TUBE MOVES THE POINTER OF THE BAROMETER

The ordinary barometer that we see everywhere is really just Torricelli's instrument; but the end of the tube is usually turned up so as to make it U-shaped, instead of having the tube straight and the end of it in a vessel of mercury. If we float an iron ball on the top of the mercury, where the tube is open, we can easily attach to the ball some arrangement with a pointer

which can tell us what the height of the mercury is in the tube, or it can be made to point to words like fair or rain.

There is another kind of barometer which has no mercury or any other liquid in it, and which is called an aneroid barometer. This literally means the barometer that has no fluid in it. It is simply a round, flat, metal box which has been emptied of air as far as possible. The top and the bottom of the box are pressed towards each other by the atmosphere more or less, according to whether the atmospheric pressure is high or low, and it is not difficult to make arrangements by which we can easily read off the extent to which the box is being pressed. The results attained by this instrument are not at all precise, but it is quite useful to have in the house as a weather-glass.

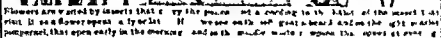
If we took an ordinary mercury barometer and made it warm, the mercury would expand, and take up more space in the tube, as most things do when they are warmed. Therefore, if we want our results to be precise, we should always be able to allow for the temperature when using a barometer.

#### THE AIR PRESSES UPON US EQUALLY IN ALL DIRECTIONS

So a good barometer always has a thermometer, or heat measurer, with it. In making a barometer, we should first boil the mercury, so as to get out of it all the air and water-vapour that we can. If we omit to do this, of course the air and water-vapour will pass out of the mercury, when we have made our barometer, into the Torricellian vacuum at the top of the tube, and they will prevent the mercury from rising as high as it ought to do.

If we take our reckoning at Greenwich, as we do in England, we find that the pressure of the atmosphere is equal to the pressure of rather more than fourteen pounds on every square inch of surface. Our own bodies are, of course, exposed on every square inch of their surface to this great pressure; and if the pressure were wholly a downward one, weighing upon our heads, we could not stand it. But a great law about fluid pressure is that at any place it is the same in all directions. Therefore, though we are pressed down upon, we are also pressed in upon from the side, and thus we are equally

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We know that plants differ in

[illegible][illegible][illegible]

behind it; and now the atmospheric pressure pressing on the surface of the fluid in the tumbler has its chance, and pushes some of the fluid up the tube, and so the tumbler may be emptied.

The atmospheric pressure is the most important and perhaps the easiest to understand of all kinds of fluid pressure. When we go more closely into the laws of fluids, we find them exceedingly difficult, yet one or two of the great results are easy to understand. The law that the pressure of a fluid at any point is equal in all directions has already been mentioned. If, however, we are to state this law quite correctly, we must add one more word. We must say not "a fluid," but "a motionless fluid." Of course, directly we introduce a new thing—which is the motion of the fluid—then the whole case is changed. For instance we do not feel the atmospheric pressure to any noticeable extent, but we *do* feel the wind.

#### AN EXTRAORDINARY MAN WHO DISCOVERED THE LAW OF EQUAL PRESSURE

This law of the equality of fluid pressure in all directions stands to the credit of that extraordinary Frenchman Pascal, whom we have already mentioned. He is to be called extraordinary because his mind was so complete. People who study religion and duty and good and evil have to read the works of Pascal, because he thought so wisely and deeply on those subjects, people who study pure mathematics have to make acquaintance with Pascal; and people who study what happens in a tumbler of water have to study Pascal, too. In the whole history of mankind there are only a very few cases like this.

Now, it is interesting to invent an experiment to prove the truth of Pascal's law. If we take an empty bottle and cork it, and push it down into deep water, or rather sink it by attaching a weight to it, the fluid pressure will force the cork into the bottle. Now, we find that it does not matter whether the bottle is right side up or up-side down or placed at any angle, the result is just the same. Therefore, to take the case of a fish swimming in the water, it is subjected to a pressure which is upwards as well as downwards and sideways. The point is that the fluid has no greater tendency to press anything in one direction more than in another.

Here we find the great difference between fluid pressure and the pressure of this book on the table, or the table on the floor or the beams of the roof against the walls of the house. The pressure exerted by one solid thing on another is in one direction only.

#### GASES THAT CAN BE SQUEEZED AND LIQUIDS THAT CANNOT

The great laws of fluid pressure are the same for both kinds of fluids; but it is very plain to everyone that, however true this may be, there must be some very great difference between the kind of fluid we call a gas and the kind we call a liquid. If we take any gas, or mixture of gases, and squeeze it, we find that it can be squeezed. When we cease to apply the force by which we squeeze it, then it expands again. The proper way of saying this is that a gas is compressible, but the other kind of fluid, which we call a liquid—as, for instance, water—is, practically, not compressible.

It has been proved comparatively recently that it is possible, with very great pressure indeed, to compress water a very little. We should understand this; but still there remains the great difference that a gas is readily compressible, and that a liquid is for all practical purposes quite incompressible. Now, as gases can be compressed by pressure, we ought to know whether there is any law governing the results. There is such a law, and that is the last thing we need learn in this part of our subject.

#### THE DISCOVERY OF ROBERT BOYLE WHICH EXPLAINS A GAS EXPLOSION

It was discovered by, and is named after, a celebrated Englishman named Robert Boyle, who lived in the seventeenth century. Boyle's law says that if the temperature of a gas remains the same, the greater its pressure the less space it fills. If this pressure is to rise, the volume must fall, and if the pressure is to fall, the volume must rise. This means that a certain proportion of gas will exert more pressure in proportion as it occupies a smaller space. We realise this when we cause a great explosion, by suddenly making a lot of gas in a very little space.

The next part of this is on page 4047.



habitat means simply the place the plant inhabits—its dwelling-place—the word will not be a hard one

All plants have their proper flowering time and they are so precise that we may go out to find their flowers at the usual season and be sure to find them, that is to say, in any year when the weather is what we have a right to expect about that date. In some years the spring is late because the cold of winter has continued much longer than is usual. In such a year the spring flowers will also be late, for they go by seasons rather than by days of the month. They put out their flower-buds and open them when the weather is most suitable for their purpose.

But what we should like to learn is how the plants know when is the right time. How do the snowdrops and crocus bulbs buried in the ground know when the frost has gone? How does the almond-tree get its beautiful pink flowers out before its leaves are seen? How does the coltsfoot, that has not a leaf above ground, get word that the time has come to send up its yellow flower-heads? They do not know beforehand exactly when that time will be, but they know it will come, and that they must be ready for it.

#### HOW THE PLANTS WAIT FOR THE SUN BEFORE PEEPING OUT OF THE GROUND

And at the end of the autumn the snowdrop and crocus fit themselves out with a new set of roots, and their flower-buds and leaves having already been formed, though still very tiny in size and hidden right in the heart of the bulb, they set to work piercing the earth with their leaves. But before they reach the surface they find it is very cold—perhaps the top soil is frozen hard—and they rest. Then, when the thaw comes, the warm spring rain soaks down through the soil, and the plants know they may safely break through the surface.

There may come a change, and for some days, or even weeks, only the tips of the leaves show. But when the mild weather has really set in, the leaves are rapidly enlarged, the flower-buds are pushed up, and a very little sunshine will cause them to open out.

We must not imagine that the plant forms its flower-bud only a short time before they open. With garden

*annuals*, the seeds of which we know are not sown until March or April, there cannot be any getting ready much in advance of the flowering time, but with bulbous plants and spring-flowering trees and shrubs the flowers in their buds were all formed by the autumn before.

#### THE WONDER OF THE BUDS IN WHICH THE TINY FLOWERS ARE HOUSED

When we go gathering wood-nuts in October we can see pairs of hard grey tassels hanging from the twigs. These are the lamb's-tails that will be long, soft, and yellow in March next. While we are picking ripe apples from the tree we can tell which of the buds are leaf-buds and which are flower-buds, by the latter being much more plump than the former. When hyacinth bulbs are bought in the autumn for planting in the garden, if we look into the hole at the top we can see that the tiny flower-buds have already formed.

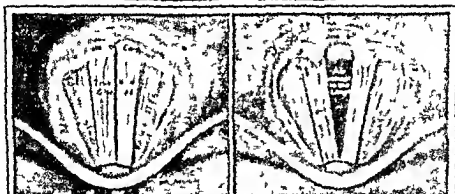
What seems more wonderful than plants being affected by the seasons, is the way they know the time of day. We have day flowers and evening flowers; but the day flowers do not all open early in the morning, neither do they all remain open until the sun sets. The goat's-beard, which is a summer flower, opens about four o'clock in the morning, and is often closed by ten or eleven, always before twelve o'clock. And so, in some parts, people call it John-go-to-bed-at-noon.

The pimpernel always closes early in the afternoon, like most other flowers that open early in the morning. None of the evening flowers open before about six o'clock. If we look at the evening primrose in the garden by day, we shall find all its flowers are closed, lump, and discoloured. But early in the evening, if we watch it, we shall see the fresh buds burst suddenly, and the beautiful yellow petals expand before our eyes. At the same time their strong, sweet perfume will fill the air. We may observe the white tobacco plant of the garden and the white campion of the cornfield behave in much the same way.

#### A CLOCK THAT TOLD THE TIME BY THE OPENING OF THE FLOWERS

Linnaeus, the great Swedish botanist, was so struck by the way in which so many flowers kept regular hours for opening and closing that he made a floral clock by planting a bed with

# The Child's Book of Its Own Life



In the first of these pictures we show how the air is forced through the narrow passage of the mouth for producing a sound. The air is forced through the narrow passage of the mouth for producing a sound. The air is forced through the narrow passage of the mouth for producing a sound.

## HEARING AND SPEAKING PRECIOUS THINGS IN OUR LIVES THAT BEGAN IN FISHES



we find many more wild flowers—and with them ferns—in the oak-wood than in the beech-wood. But whether in oak-wood or beech-wood, or even under the shade of hedges in the lanes, the greater number of the plants have to let their work done in spring, before the thick growth of leaves overhead shuts out the light and causes them to rest.

#### WHY THE FLOWERS OF SPRING ARE FOUND BENEATH TREES AND BUSHES

That is why some of them appear to be in such a hurry to pop up their heads as soon as the frosts have gone, and why they have disappeared altogether from sight before the wild roses are out. If we think of any wild flower of spring, and the place where it grows, we shall almost always find that the place is over-shaded by the trees and bushes when they are covered with leaves, or by the summer-flowering plants of taller and coarser growths.

Long, long ago, some of the plants with the smallest flowers must have found out that, with bigger and higher flowers around them, they were in danger of being overlooked by the insects. It was not to their interest to make their flowers large, because they were already fitted for the small beetles and flies that did the work of carrying their pollen for them. So they hit upon the good idea of bringing a large number of their tiny flowers together. You will find this idea carried out by such plants as Jack-by-the-hedge, the bedstraws, woodruff, and others. Then plants like the parsley, carrot, parsnip, hogweed, and a host of others, arranged their tiny white or yellow flowers each on a little footstalk, but made a score or two of these footstalks start off from the tops of a tall stem, so that they looked like the ribs of an umbrella when the wind has blown it inside out. On that plan all the tiny little flowers came close together in a flat bouquet, and, of course, were then seen as easily from a distance as any large flower.

#### HOW THE PLANTS WITH LITTLE FLOWERS IMPROVE THEIR BLOSSOMS

The elder-tree and the wayfaring-tree followed a similar plan, and made huge flat bunches of their small white flowers. But the guelder rose improved upon the plan. It seems to have said, "We can make our bunches larger still, if the outer row will agree to give up their

stamens and pistils, and put all their strength into making themselves as big as they can." So the outer flowers, though they wanted to make seeds as well as the others, agreed to give up their own wishes for the good of their race, and to-day, if we look at a bunch of these flowers, we shall find that the outer blossoms are twice the size of the others, but they have not a stamen or a pistil among them.

We do not know that plants copy each other, and try to "go one better," as boys and girls and men and women do, but if we were telling a fairy story about the flowers, we should feel warranted in making the dandelion say "I know a better plan than that. What a waste to have all those short footstalks to your flowers! Build a platform at the top of your flower-stem, and on that pack a couple of hundred flowers as close as they will go." What we call a dandelion flower is really two

#### THE DAISY THAT PACKS ITS WHITE AND YELLOW FLOWERS ON A PLATFORM

hundred flowers, as you can see by pulling one of the golden flower-heads to pieces. Then, in our fairy tale, we could make the daisy say that it had a better plan even than that of the dandelion. "I shall pack my flowers together as she has done, but I will make mine brighter by getting the outer row to give up their stamens and put their strength into making long white ribbons to stick out all round, and set off the yellow flowers in the middle. They need not give up their hope of seeds, they can still have their pistils, and the insects will bring enough pollen for them as well as for the yellow flowers." If we pick a daisy head and compare it with a dandelion head, we shall see just this difference between them. Thistle and sunflower, tansy and oxeye, coltsfoot and ragwort, hawkweed and chicory, have all heads of closely packed flowers, and they look as though some had copied the dandelion, and others the daisy.

When we are out of doors, in the garden or the fields, we must look at all the kinds of flowers we can find, and must take note of their shapes and colours, and see where they grow, and what kinds of insects are settling upon them. Then we shall become interested in all the flowers and learn to love them.

The next story of Plant Life is on page 4109.





In fact, what we are here dealing with is the sense of balance and it is probably more or less of an accident that its machinery happens to be such a close neighbour to that of the sense of hearing.

#### A LITTLE-KNOWN PART OF OUR BODY THAT HELPS US TO STAND

This sense of balance is, in a way, a sense that tells us about the outside world like hearing or vision, because it *does* tell us where the outside world is in relation to our bodies. But it is quite unlike the senses we know so well as it is not arranged to receive anything from the outside world at all, and so, unlike the eye or ear, it has no connection with the surface of the body. We may say that this is one of the senses which tell the brain about the body, rather than about the world outside the body.

Before we study the organ of this sense, we must notice, in the first place, that it is helped by other means. We do not entirely depend for our balance upon the organs of balance in the base of the skull, though we certainly cannot balance ourselves without their assistance. When we stand, for instance—and standing is a very much more difficult matter than we usually suppose—our power of balance is greatly helped by the feelings we get from the soles of our feet. If something is painted on to the soles of our feet so that the skin there can no longer feel, or in cases of illness which have the same result, we cannot stand so easily as we usually do.

But the sense of balance is also helped by the eyes. As long as the eyes are open, even a person who is not helped by the soles of his feet may balance himself, or, with his eyes shut, he may yet balance himself if he stands with his feet far apart, but if he puts his heels together, and shuts his eyes, he will probably topple over on the ground.

#### THE GREAT USE OF THE EYES IN BALANCING THE BODY

People, however, can stand with their heels together, and with their eyes shut, thus doing without the assistance of sight, if the organs of balance in the skull are all right, and if guidance is also coming to the brain from the soles of the feet, and also from the muscles and joints of the legs. If we set ourselves the task of balancing on a very narrow plank, or,

still more difficult, on a tight-rope, then our eyes become more useful, and, unless we are very skilful indeed, they are quite necessary. Everyone knows how the tight-rope walker keeps his eyes steadily fixed on a certain point, and so greatly helps himself. If he is very skilful, he may walk on the tight-rope even though he bandages his eyes, but this is far more difficult. However, the eyes and the feelings from the skin and joints and muscles are all unimportant compared with the guidance we get from the special organs of balance, and no one was ever yet able to stand or walk on the ground, much less on a tight-rope, in whom these organs were not working properly. Now we must learn what they consist of.

In the hard bone that contains the inner ear, and close to the inner ear—on each side of the head, of course—we find this organ of balance, of which a picture is given on page 3866. It consists of three tiny tubes, in shape like half a circle.

#### THE SIX LITTLE TUBES WHICH TELL THE BRAIN OUR MOVEMENTS

The proper name for a half-circle is a semi-circle, just as half a tone is a semi-tone, and the corresponding adjective is, of course, semi-circular, not a difficult word if we know how it is made up. The proper name for these tubes, then, is the *semi-circular canals*, and of these the head of every human being and of all the higher animals contains six, three on each side. They are all filled with fluid.

Just as the nerve of vision runs to the eye and the nerve of hearing to the ear, so the nerve of balance runs to the semi-circular canals. The ends of the nerve—that is to say, the ends of the countless nerve-fibres which make the nerve—lie close to the fluid that fills the canals, and if that fluid moves, or if the pressure on it changes in any direction, the nerve-fibres know about it.

Now let us look at an ordinary child's block, which we call a cube. If we want to measure it, we find that it can be measured in three directions—from top to bottom, from side to side, and from back to front. We may pick up any solid thing, and we find the same is true of it. We may want to measure a room, and we find again that the same is true, we must measure the floor in both directions, and we must also measure the height of one of the walls.



the head moves, and not with the direction of sound. It is much more important to know what the head is doing than to know where sound comes from, and, in any case, by having external ears that can be moved, a creature can easily enough judge of the direction of sound without any special machinery inside its head. If we human beings are not so well off in this respect, it is because we have lost the power of moving our outer ears like the animals.

**THE FISH'S GILLS, UPON WHICH MANY PRECIOUS STRUCTURES ARE BUILT UP**

We have lost this power that the animals have, but we have gained many things that the animals have not. In the very lowest vertebrate animals, such as the simplest fishes, and also in the higher fishes, too, we find instead of lungs, what are called gills. To these the blood runs, as it runs to our lungs, and in them it comes in close relation with the oxygen dissolved in the water, just as in our lungs the blood comes in close relation to the oxygen of the air. The gills have to be supported on something, and so we find in the fish five gill-arches, with slits between them called gill-slits.

Gills did not develop into lungs, but lungs developed from a quite different organ, called the swim-bladder, of the fish. Now, we might suppose that when backboneed animals left the water and began to breathe air, no use was found for the gill-slits and gill-arches, as the gills were not made into lungs. But some of the most wonderful and precious structures of the higher backboneed animals have been developed from the gill-slits and the gill-arches.

**HOW THE SWIM-BLADDER OF THE FISH BECAME THE LUNG OF THE ANIMAL**

We can never tell what uses Nature will turn a thing to, and the history of life upon this earth proves over and over again that organs which would appear to have lost all their use, and of which nothing could be made, may be turned to new and utterly different purposes, rather than be wasted. Nature took the swim-bladder, which used to be filled with air, and helped the fish to swim at the level it liked, and when the creature no longer swam under the surface at all, she made it into a lung. Thus Nature, so to speak, had gill-slits and gill-arches thrown on to her hands

with their occupation gone. By long and careful study of many animals we have been able to trace what happens to each of these, and it is one of Nature's great triumphs in the development of the bodies of the higher animals that she has been able to do with these apparently useless things what we shall now learn.

Out of them she has made the whole of the semi-circular canals. Thus she has provided for the balance of the bird out of the organs which helped the fish to breathe. From these organs, also, she has made the whole of the ear, including the little bones in the middle ear, and all the wonderful structure of the inner ear. As if this were not enough, she has also made out of the gill-arches an organ no less new and wonderful than the voice-box, or *larynx*, by which we speak and sing. This is, perhaps, the triumph of triumphs, because the gill-arch was invented for a creature living entirely in water, and the whole use of the larynx depends altogether upon the breathing of air.

**THE VOICE-BOX, AND THE SERIOUS PART IT PLAYS IN OUR LIVES**

Now, instead of going on to study another sense at this point, it is much better, for two very good reasons, that we should go on to study the larynx. First, we should do this because then we shall be studying together the various organs that have been developed in the higher animals from the gill-arches of the fish, and, secondly, we should do so because it is well to study the means by which we produce sounds, after studying the means by which we hear them.

We all know something, at least about the larynx, because we have all seen the front part of it pushing the skin forward and sometimes moving up and down. There is a foolish notion that this is the apple which Adam swallowed, and which stuck in his throat, and so it is sometimes called Adam's apple. A larynx, or voice-box, similar to ours is to be found in all the higher animals, and, as we know, it is simply a stringed musical instrument. In the case of the birds, many of which have such beautiful voices, there is besides this stringed instrument another, which is practically an organ-pipe. But, in all its forms, and whether with or without this organ-pipe, the larynx is evolved from one of the gill-arches of the fish.

## BIBLE STORIES The Life of Jesus

### THE PARABLES

THE word parable means a *comparison*. But the word is used in more ways than one. David says in Psalm 49 "I will open my mouth in a parable: I will utter dark sayings of old" while St. Mark makes the Master say to His disciples "Unto you it is given to know the mystery of the Kingdom of God, but unto them that are without all these things are done in parables." One use of the word, so to say is for *hiding* the real meaning. The other meaning is the very opposite of this, namely to make clear what is dark, to express vividly by a comparison what is really inexpressible. It is clear that Jesus employed the parable, both with the multitude and His disciples, in its most natural form namely as a form of speech in which two similar things—things of one another yet drawn from distinct spheres of observation, are laid alongside of one another for the purposes of greater vividness and illumination.

## THE WORD-PICTURES OF JESUS

### THE STORY OF THE PRODIGAL SON

this. It is interesting, therefore, to know of what the vocal cords are made, so that they can stand such varying degrees of tightness within a few seconds, without injury. They are simply made of fibres of what we call elastic tissue, such as is found in various parts of the body wherever it is needed. But an ordinary piece of elastic is rubbish compared with the elastic tissue made by the body.

#### HOW THE VOCAL CORDS ARE TIGHTENED TO PRODUCE DIFFERENT SOUNDS

The next question is—How is their tightness varied? In front, just behind the part of the voice-box that we see from outside, the cords are fixed to the largest cartilage of the larynx, but, behind, each of them is fixed to a tiny little knob of cartilage which is delicately jointed to the part that it rests on so that it can be tilted in several directions.

What really happens when we sing is that these little knobs of cartilage are tilted backwards so that the cords are made tighter when our voice ascends in pitch, and are tilted forwards so that the cords are made slacker when our voice falls in pitch. This is easy to say, but the picture on page 3953 will show what the cords are like; and the muscles which do all this work are tiny little shreds.

When a singer is producing one of his highest notes, the cords have to be so tight as to vibrate four times as often in every second as when he is producing one of his lowest notes. Thus, in the whole range of Nature, there is scarcely anything more perfectly delicate than the control which a singer has over this tiny little machine to produce such results.

#### WHY THE HUMAN VOICE IS MUCH MORE MARVELLOUS THAN A PIANO

Now do we suppose that the singer is much limited to the number of notes that he can give on the piano in the ordinary range of pitch? No, he can give a note as low as the lowest note of the piano, and a note as high as the highest note of the piano, and he can give a note as low as the lowest note of the piano, and a note as high as the highest note of the piano, and he can give a note as low as the lowest note of the piano, and a note as high as the highest note of the piano.

As we have seen, the human voice is much more marvellous than a piano. It can give a note as low as the lowest note of the piano, and a note as high as the highest note of the piano, and it can give a note as low as the lowest note of the piano, and a note as high as the highest note of the piano.

are attached; and that depends upon the force of the nerve-current sent to the nerves through these muscles from certain nerve-cells in the brain. The place, therefore, where the unravelled delicacy of this machine really exists is the nerve-centre in the brain.

As everyone knows who has tried to read a song he was not sure of, or as anyone may observe who watches a child learning to sing, it is one thing to have all the machinery for producing a note that is easily within the range of our voice, and it is quite another thing to be able to produce that note when we want to. There are two stages of difficulty here, and the second is marvellous beyond anything we have yet described. The first of these is where we simply imitate a note we hear.

This is quite wonderful enough, for it means the beautiful working together of the cells in the hearing centre of the brain with the cells of that part of the brain which gives orders to the muscles of the voice-box.

#### THE MYSTERY OF THE WRITING AND SINGING OF MUSIC

But now take the second case, where a singer sings aloud the notes of a piece of music that he has never seen before. What is it that he imitates now? What is it that guides him? We can only say that the singer imitates, or realises, his idea of a certain sound that he has in his mind, but what and where the idea really is, and how the singer can do what he does, no one can say, for we are here in the realm of the mind—the most mysterious of all things, and it baffles us utterly.

Lastly, we have the case of the composer sitting down with a pencil and a sheet of paper, and creating music "out of his head" for other people to sing and play. Some of the greatest music ever written—music which has made miserable people happy, and cowardly people brave, and frightened people solemn, and will endure to the end of time—was written by a man named Beethoven many years after he had become deaf. He never heard a note of the greatest and most wonderful part of the music that he wrote, and yet, in his mind's ear, he heard it all. How anyone can do this is a mystery. The mystery of the writing and singing of music.



said unto him, Father, I have sinned against heaven, and in thy sight, and am no more worthy to be called thy son. But the father said to his servants, Bring forth the best robe, and put it on him, and put a ring on his hand, and shoes on his feet, and bring hither the fatted calf, and kill it, and let us eat, and be merry: for this my son was dead, and is alive again; he was lost, and is found. And they began to be merry.

Now his elder son was in the field, and as he came and drew nigh to the house, he heard musick and dancing. And he called one of the servants, and asked what these things meant. And he said unto him, Thy brother is come, and thy father hath killed the fatted calf, because he hath received him safe and sound. And he was angry, and would not go in: therefore came his father out, and entreated him. And he answering said to his father, Lo, these many years do I serve thee, neither transgressed I at any time thy commandment: and yet thou never gavest me a kid, that I might make merry with my friends: but as soon as this thy son was come, which hath devoured thy living with harlots, thou hast killed for him the fatted calf. And he said unto him, Son, thou art ever with me, and all that I have is thine. It was meet that we should make merry, and be glad: for thus thy brother was dead, and is alive again, and was lost, and is found.

This parable stands in the front of all the parables, because it is the one which has done most, not only to draw men from wrong-doing, cruelty, and brutishness, but also from the dangerous feeling that it is no good trying to be good when once one has fallen. It teaches that our Father moves to meet us with love and mercy directly we begin to turn away from what we were so blind as to deem better than His gift of eternal life.

#### THE GOOD SAMARITAN

Jesus had spoken to a questioning lawyer about love for God and love for our neighbour. The lawyer, wishing to justify his questions, asked, "And who is my neighbour?" To the poor, paltry pride of this little lawyer we owe the great parable of the Good Samaritan.

"A certain man," said Jesus, "went down from Jerusalem to Jericho, and fell among thieves, which stripped him of his raiment, and wounded him, and departed, leaving him half dead. And by chance there came down a certain priest that way, and when he saw him, he passed by on the other side. And likewise a Levite. . . . But a certain

Samaritan, as he journeyed, came where he was: and when he saw him, he had compassion on him, and went to him, and bound up his wounds, pouring in oil and wine, and set him on his own beast, and brought him to an inn, and took care of him. . . . Which now of these three, thinkest thou, was neighbour unto him that fell among thieves?"

When the lawyer had answered, Jesus said, "Go, and do thou likewise."

Here, in a convincing story, Jesus showed the Brotherhood of Man. Our neighbour's name is Everyman. Whatever language he speaks, whatever the colour of his skin, whatever are his religion and customs, he is our neighbour. The Priest and the Levite may go by, but he who serves God will recognise his neighbour in every stranger who happens to fall by the way.

#### THE SOWER

The parable of the sower has been endeared to us by a beautiful harvest hymn, and painters in all lands have given us striking pictures of the Sower, passing up the furrows casting the seed which shall feed mankind to right and to left of him. It is interesting, too, because of the place where the parable was spoken.

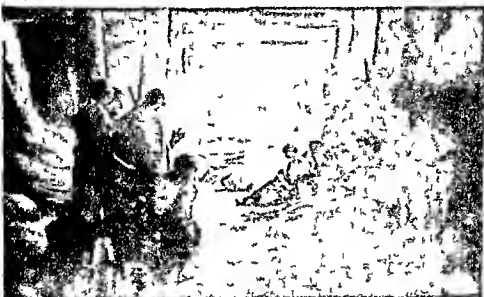
Jesus, thronged about by a great host of people, who pressed Him even to the water's edge, entered a fisherman's ship, and in this gently rocking craft, with the multitude standing on the shore, He spoke to them. The sight of all those people, so eager to hear what He had to say, suggested an instant comparison to His mind.

"Behold," He said, "a sower went forth to sow." And then the story unfolded itself—the story of the fate of the seed, how some fell on stony places, how some were devoured by birds, and how some fell among thorns, but how some fell into good ground.

What is the fate of the seed? It depends upon the condition of the soil where it falls. The sunset which fills us with mystery and ecstasy is the same sunset to which the foolish man looks without admiration or emotion of any kind. The exquisite beauty of Christ's teaching in some men produces a mere form of worship, in others a devotion to the poor and sorrowful, in others a fear of the next world, in others a passionate longing for the love of God now and

# PICTURES FROM THE LIFE OF JESUS

Nothing has ever inspired the artist to such a noble and true life and teaching of Jesus. The scenes are all taken from the tender story of His life and death. It is a story of love and sacrifice, of the path of the Son of Man. The world is full of such scenes, and in these pictures we see the life and death of Jesus.



THE VISIT OF THE SHEPHERDS TO THE INFANT JESUS



THE VISIT OF THE SHEPHERDS TO THE INFANT JESUS



to the Pharisees, and said "Like-wise, I say unto you, there is joy in the presence of the angels of God over one sinner that repenteth"

### THE WHEAT AND THE TARES

The parable of the wheat and the tares has become one of the most familiar of all the stories of Jesus. Here, teaching its simple lesson with power, is the whole of it

The kingdom of heaven is likened unto a man which sowed good seed in his field but while men slept, his enemy came and sowed tares among the wheat, and went his way.

But when the blade was sprung up, and brought forth fruit, then appeared the tares also.

So the servants of the householder came and said unto him, Sir, didst not thou sow good seed in thy field? From whence then hath it tares?

He said unto them, An enemy hath done this.

The servants said unto him, Wilt thou then that we go and gather them up?

But he said, Nay, lest while ye gather up the tares, ye root up also the wheat with them. Let both grow together until the harvest and in the time of harvest I will say to the reapers, Gather ye together first the tares, and bind them in bundles to burn them; but gather the wheat into my barn.

### THE GREAT SUPPER

The great supper is another of the parables of Jesus that we must not omit from this section.

A certain man made a great supper, and bade many and sent his servant at supper-time to say to them that were bidden, Come, for all things are now ready.

And they all with one consent began to make excuse. The first said unto him, I have bought a piece of ground, and I must needs go and see it, I pray thee have me excused. And another said, I have bought five yoke of oxen and I go to prove them; I pray thee have me excused. And another said I have married a wife, and therefore I cannot come.

So that servant came and showed his lord these things.

Then the master of the house being angry said to his servant, Go out quickly into the streets and lanes of the city, and bring in hither the poor, and the maimed, and the blind, and the blind.

And the servant said, Lord, it is done as thou hast commanded, and yet there is room.

And the lord said unto the servant, Go out into the highways and hedges and compel them to come in, that my house may be filled. For I say unto you, That none of those men which were bidden shall taste of my supper.

When we read these parables in the Bible, we should remember the striking truth they bring home to us of Christ's certainty and calm in the midst of conflict and apparent defeat. He was only a peasant, only the poor and the outcasts followed Him; in all the great cities there were the great priests of the old-established religion, and the learned philosophers of Greece and Rome. But Jesus was unafrighted, and calmly certain of His final triumph.

Again and again in beautiful parables and striking sayings He told His disciples that the work begun so simply and so humbly among the poorest people would one day encompass the world. Never was teacher so serene concerning the victory of his teaching, never was prophet so reliant on the triumph of God.

It is to the parables that we turn again and again, and yet again, when we want to draw closer to the voice of Jesus. Here is enshrined in picture form, and in more certain language than anywhere else, the teaching which, so strangely simple and childlike that even the most ignorant may understand it, is yet the sublimest known among men.

Concerning doctrine and the conflict of Churches there may be doubt and distress in our hearts; but in the beautiful 'country of the parables all is peace and rest. We feel that Christ is there. We close our eyes, and almost feel that we are on the hillside of Nazareth, close to the gentle Teacher, the music of His voice in our ears.

We seem to be of that favoured company of simple men who spent their days with the Master, listening to the words as they fell from His lips. All difficulties are cleared away, our path lies straight before us, and the memory of the beautiful, unselfish life of Jesus inspires us to be strong to follow the teaching of the parables, and to conquer our weaknesses.

The next Bible Stories are on page 4103.

# PICTURES FROM THE LIFE OF JESUS

Nothing has ever inspired the artist's heart like the life and teaching of Jesus. The gentleness, the tenderness of His tones and the impulse all around to give the artist the opportunity to paint the most beautiful scenes in and in those places where the life of Jesus was lived.



THE VISIT OF THE SHEPHERDS TO THE INFANT JESUS



THE VISIT OF THE SHEPHERDS TO THE INFANT JESUS

# JESUS AS A CHILD WITH HIS PARENTS



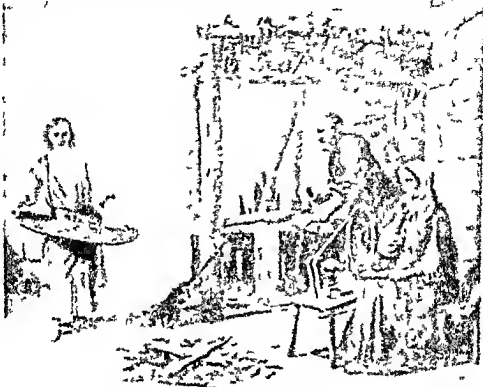
JOSEPH AND MARY, WITH THE INFANT JESUS, FLEEING INTO EGYPT FROM THE WRATH OF HEROD



JESUS, AS A BOY OF TWELVE, FOUND BY HIS PARENTS AMONG THE DOCTORS IN THE TEMPLE

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# JESUS IN THE CARPENTER'S SHOP



# PICTURES FROM THE PARABLES OF JESUS



THE POOR THE MAIMED AND THE BLIND BEING BROUGHT TO THE GREAT SUPPER

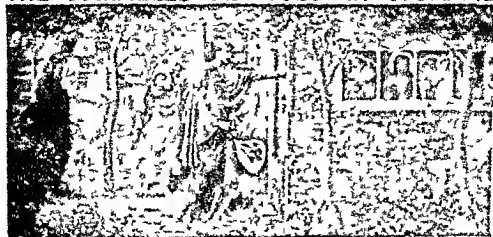


THE RICH YOUNG RULER WHO WENT AWAY

THE WOMAN SEARCHING FOR LOST SILVER

The upper picture is copyright 1920 by Messrs. Brain Clement and Company and the picture of the Young Ruler entitled "For he had great possessions" is from the painting by G. I. Watts R.A. by permission of Frederick Hollyer

# THE PARABLES AS TOLD IN PICTURES



THE FOOLISH VIRGINS KNOW NOT HOW TO ENTER THE KINGDOM AFTER THE BRIDE HAS GONE



# JESUS WEeping OVER JERUSALEM



"IF THOU HADST KNOWN!" JESUS WEeping OVER THE CITY THAT REJECTED HIM



THE PRODIGAL SON IN THE FAR COUNTRY RESOLVES TO GO BACK TO HIS FATHER

The upper picture is from the painting by William Holte, and is published here by permission of Messrs. Havnstaen.

## JESUS IN THE HOUSE OF MARTHA AND MARY





# JESUS PASSING BY THE SORROWFUL WAY



JESUS ON THE WAY TO CALVARY, URGING THE WOMEN OF JERUSALEM NOT TO WEEP FOR HIM  
 This picture of the painter, by Bouguereau, reproduced from a photograph by Messrs. Braun Clement.  
 THE EAST LINDSAY STORES ARE ON PAGE 4103

# The Child's Book of WONDER



The lands of a large rock at mine 1 Northwick in Cheshire. Surrounded by new rock.

## WHERE DOES SALT COME FROM?



1. 1905. 10

throbbing just underneath the skin, just a little tube expanding and contracting seventy or eighty times a minute.

As a matter of fact, that is just what the pulse is, and that is what happens. It is a wave of blood which is being sent along an artery by the force of the beating of the heart, and as the wave is confined inside this vessel or artery, which was already full of blood, the artery has to dilate or expand in order to receive the blood which is being pumped into it. Each time this happens we feel the throb, so that by feeling our pulse and counting how often it beats or expands in a minute, the doctor can find out how often our heart is beating in the same time, because each throb of the pulse corresponds to a beat of the heart. We should understand, however, that the pulsating movement is not only to be found at the wrist, it occurs in every artery all over the body.

#### HOW CAN DOCTORS TELL OUR TEMPERATURE BY FEELING OUR PULSE?

The rate at which the pulse beats and the height of the temperature in the body have a distinct connection with each other, and go more or less together, so that when the doctor counts the pulse rate, and finds that it is just the rate it should be, he expects also to find the temperature quite usual. If, however, he finds that the pulse is twice as rapid as usual, he will also probably find that the temperature is much higher than normal because the thing that causes the one to become rapid causes the other to go up. Thus, in all cases of fever, where there is some poisonous substance in the body, this substance causes the heart to beat quickly, and the pulse to become rapid, and it also causes a disturbance in that part of the brain controlling the temperature, so that both the pulse and the temperature are thrown out of gear.

#### WHY ARE SOME DISEASES INFECTIOUS AND NOT OTHERS?

If we had asked this question a hundred years ago, not even the wisest men could have answered it, but we know now that what we call infection is due to the presence of a vast number of very tiny living cells called germs, or microbes, or bacteria. These little creatures are so small that it requires very high magnifying powers in a microscope to see them, but it is by

their action on the living tissues of plants and animals that many diseases are produced. These germs are so small, and so light, that they can be carried about in the air and breathed out from our lungs, so that they may contaminate the atmosphere or our food and so spread disease wherever they go. That is what is meant by carrying infection. Thus the germs which cause typhoid fever or diphtheria often get into a milk supply or a water supply, and so cause an epidemic amongst all the people who use that source of water or milk.

There are many diseases which are not infectious, because they are not caused by these germs. For instance, many diseases are due to various forms of violence and pressure. This may be caused by lack of blood, or by blood being stopped from circulating properly. Still other diseases are due to various chemical substances which act as poisons upon the tissues of the body, while others are the result of extremes of heat and cold.

But all these concern only the individual to which they apply at the time, and are not capable of being transmitted to somebody else, as are the diseases caused by living creatures.

#### WHAT CAUSES CRAMP?

Cramp is really a spasm or contraction of a whole limb, or sometimes only of one or two muscles in a limb, or in the body. It may be very painful, or may be present along with numbness. We have, perhaps, often felt a sudden pain in playing some game or other when we are seized with cramp in a muscle, and this pain has, perhaps, passed off after a little vigorous rubbing. It may also be caused by over-exertion and severe cold, and is probably due to some complicated change occurring in the muscle itself.

A sharp rubbing over the surface of the muscle will usually put it right, but if we should happen to be seized with cramp when swimming, we can easily understand that it is very dangerous, because we must get to land before the cramp can be treated, and the fact that we have been seized with cramp might prevent us doing so. This is one of the reasons why it is dangerous to stay too long in cold water when bathing, or to go beyond our depth.



once the custom in China to place a very tight bandage round the feet of the ladies, and this was kept on always, with the result that the feet did not grow to their proper size. So that the result of the pressure on the skin depends entirely upon whether it is continuous, and whether it is severe. The overgrowth of the skin is due to the irritation produced by the pressure.

#### WHAT ARE FRECKLES?

What we usually speak of as freckles are spots of a yellowish-brown colour which are seen on the skin of some people especially after they have been exposed to strong sunshine for some time. They occur chiefly on the face, on the neck, and on the hands, because those are the parts of the skin unprotected by clothes. Some people are much more liable than others to have this colouring produced, and in some it disappears quite quickly, while in others it lasts a long time.

In all these cases the freckles are the result of the action of the sun on certain cells of the skin, which causes these cells to produce colouring matter, or pigment, which remains there for a certain time. There are cases, however, in which freckles do not appear to be caused by very hot sunshine or exposure, but which come naturally, just as the colour of the skin itself is either fair or dark, according to the tendency inherited by the individual.

#### WHY DOES ANYTHING PUT ABOVE A FLAME ATTRACT IT?

The direction a flame takes depends entirely on the currents of the air moving around it. If the flame is burning in a still atmosphere it points straight upwards, because the hot air above it is lighter than the colder air below, and so tends to rise and make a draught upwards in the direction of the flame which has to be filled up by the cold air beneath. Now, if we hold, say, a key above such a flame, this process is made more marked because the hot air is turned aside by the key, and so makes a stronger draught, the current of which points to the centre of the key. The air at that spot is hottest, and rises very rapidly, and the hotter it is the stronger is the draught in that direction. Therefore, the point of the flame is attracted to that spot.

#### WHY DOES NOT THE WATER FALL OUT OF A QUICKLY REVOLVING PAIL?

We must remember that every substance, whether it be a solid or liquid, tends to remain in the same position unless some force is applied to it to move it. The force of gravity keeps the water in the bucket when the bucket is at rest, and attracts both the bucket and the water to the earth. When we swing the bucket over our heads, gravity would cause the water to fall out if we held the bucket still, but by keeping it moving we bring other forces into action which act in other directions, and tend to make the water press against the sides of the bucket.

If the water could get out it would not fall straight down to the earth, but would go on some distance in the direction in which the bucket was moving at the moment, and would gradually come to the earth. So that the water stays in the bucket as the result of the several different forces acting upon it while it is being swung quickly round and round.

#### WHY DOES A BEE DIE WHEN ITS STING COMES OUT?

What we call the sting of a bee is not really meant to be used as a sting. It really exists to help the bee lay its eggs, and when the bee uses the sting, as we call it, it is roughly torn away from the bee's body, causing damage which is soon fatal. This is a very curious case where part of an animal's body has had its real purpose changed, but the change has required a heavy cost, for the sting cannot be used except at the cost of the bee's life.

This means that to use its sting is an act of suicide on the part of the bee, and if a bee lived for itself, this would indeed be a foolish means of protection. But every bee lives for the hive, and the real use of the sting is not to attack us, for instance, when we hit at a bee with a handkerchief, but to protect the beehive from its enemies. The bee's sting is not a weapon of offence, but of defence—not self-defence, but hive-defence. It is used only under provocation, and only for the sake of others and the future of the bee race. The bees that sting do not themselves lay eggs, and so it is that they are able to turn this part of their body to quite a new and utterly unselfish purpose.



IS IT TRUE THAT THERE IS THE SIGN  
OF A LOST EYE ON OUR BRAIN?

It is quite true that there is a part of the brain which is supposed by very learned men, who have studied the brains of all kinds of animals, to represent an eye which occupied the position of the middle line of the head right in the centre. This structure is still present in animals to-day, and even in man himself although it no longer has any function belonging to sight. But, curiously enough, there is still existing in the far-off country of New Zealand a lizard whose proper name is sphendon, in which this central eye is so near the surface that it can still be affected by the rays of light.

This curious creature seems to be the only remaining animal in the world in which this eye exists. It is thought, therefore, that some animals had originally one eye in the middle, and that as they evolved into more complex creatures the one eye has become separated into two, a right and a left eye.

WHY CAN WE HEAR A WHISPER ACROSS  
THE DOME OF ST PAUL'S?

Perhaps we have often noticed, when we have been in different buildings listening to somebody speaking, either at a lecture or in a church, that it is sometimes much easier to hear the speaker than at other times, and that this does not seem to depend upon the size of the building. In fact, in some very large buildings it is very easy to hear perfectly, and in some quite small buildings it is extremely difficult.

It all depends upon the shape and arrangement of the walls in relation to the sound-waves which have to come to our ears before we can hear anything. Now, in the dome of St Paul's the construction and arrangement of it is such that the sound-waves which are set up even by a whisper are so controlled that a person standing at a distance can hear them distinctly. It is a mere matter of directing and controlling waves of sound so that they are not dispersed, and that is why we hear them.

DO WE ALWAYS WAKE WHEN WE HAVE  
HAD AS MUCH SLEEP AS WE WANT?

This is an extremely important question, because the answer to it must decide one of the most essential points in taking care of children. At one time, the view used to be held that children were naturally lazy and

naughty, and that Nature in general had done things so badly that, to give the children a chance, it was necessary for grown-up people to interfere with everything that the little ones inclined to do. On this theory, the children were awakened at a fixed hour, as if all children required the same amount of sleep, as if the same child always required the same amount of sleep every night, and as if all sleep were of the same quality, and so could be measured by hours. This was all wrong.

People who really know—because they have given their lives to studying the subject—are certain that a child will wake when its brain has had all the sleep it needs. The waking is the proper fruit of the sleep. A child could not sleep too long, because directly sleep has done its work the brain must wake, that is what sleep is for. On the other hand, the slightest noise may awaken children before they have had their sleep out, and then grown-up people call them cross and naughty, and say they have got out of bed the wrong side, and all that sort of nonsense. It is only a few children that get all the sleep that Nature asks for them, and it is believed that a large number of these children afterwards become the leaders of their generation.

WHAT MAKES NOISE, AND CAN IT BE  
HEARD WHERE THERE IS NO AIR?

What we call noise is all those kinds of sound which have no musical quality. They are not musical because they consist of waves in the air which are not regular, but which just come "anyhow" against the ear.

We usually speak of sound as a wave in the air, because that is what it generally is. Certainly it cannot be heard where there is no air, if by "no air" we mean a vacuum—a space from which the air has been removed as far as possible. But the waves that make sound can be carried through other gases besides those that make up air, or through liquids or solids. Sound travels quite readily, for instance, through water. We know only too well that it travels through solids, for shut windows do not exclude the sound of the streets from our ears, though they make the sound less. This means that the wave movement of the air outside the window is communicated to the glass, and then by the glass to the air inside the room.





those things. The proper word for this state is fatigue. Now, if we take a piece of steel like a razor, which can do certain things, such as cut very sharply and if we overwork it—as we should say if we were talking of a horse—we may find that it will not cut as it used to do, however carefully we prepare its edge. Something has happened to it which prevents it from doing what it was able to do before. We are quite entitled to call this "getting tired," as we do in the very similar case of ourselves.

The fatigue of metals, as it is called, is now a well-known fact, to the study of which at least one well-known student has devoted much of his life. It may be of very great importance at times in the use of tools and machinery, as any one may guess who finds that his razor needs a rest. But the fatigue of metals is also very interesting in another way, especially when we begin to learn how it depends upon changes in the way in which the molecules of the steel are joined to each other. For it may be that, if we could learn fully about the causes of tiredness and the cures of tiredness in razors, and things like that, we might better understand fatigue in ourselves, how to prevent it and how to cure it.

WHY ARE THERE TWO TIDES A DAY?  
This is a very puzzling question, to which very few people know the answer. The earth only spins round once in a day, and the moon pulls the water up towards itself on the side of the earth next the moon, making what we call high tide. Any one would think, then, that there must be only one high tide a day. But the moon not only pulls the water up toward itself the side of the earth that is next it at any given moment, it also pulls the earth towards itself away from the side farthest from the moon.

The moon attracts the earth more verfully than the water on the far side of the earth, since that water is her away from the moon. So when high tide anywhere, it is also high on the other side of the earth. This must mean that we get two tides in twenty-four hours—the first of them, perhaps, is due to the moon heaping up the water on the side of the earth next it—the side of the earth where we are. But twelve

hours later the earth has spun round so that we are on the side away from the moon, and now the moon is pulling the earth towards itself more strongly than it is pulling the water, so the water where we are is heaped up again, and that, of course, makes the second high tide we have in the twenty-four hours.

### DID MAN ALWAYS TALK?

We can only give a *probable* answer to a question like this, for evidently we have no certain way of finding out the answer. Some people have supposed that there must have been a time when man did not talk, and so they have given a special name to men of that period. But we may be almost sure that they are wrong. The lowest kinds of human beings now living certainly talk, but they are much higher than the first men were, no doubt.

We know that the highest kinds of apes have a sort of language, and that makes it probable that the earliest men had a language too. Indeed, many people think that language, or speech, is exactly the thing that makes man, and that mankind, therefore, came into existence exactly when the ancestors of men became developed into beings that could talk. Another way of saying this is that we could not call beings human who had not the power of speech in some form or other. Such beings could not teach each other from generation to generation as human beings do, and, in a word, they would only be animals, to say the best of them.

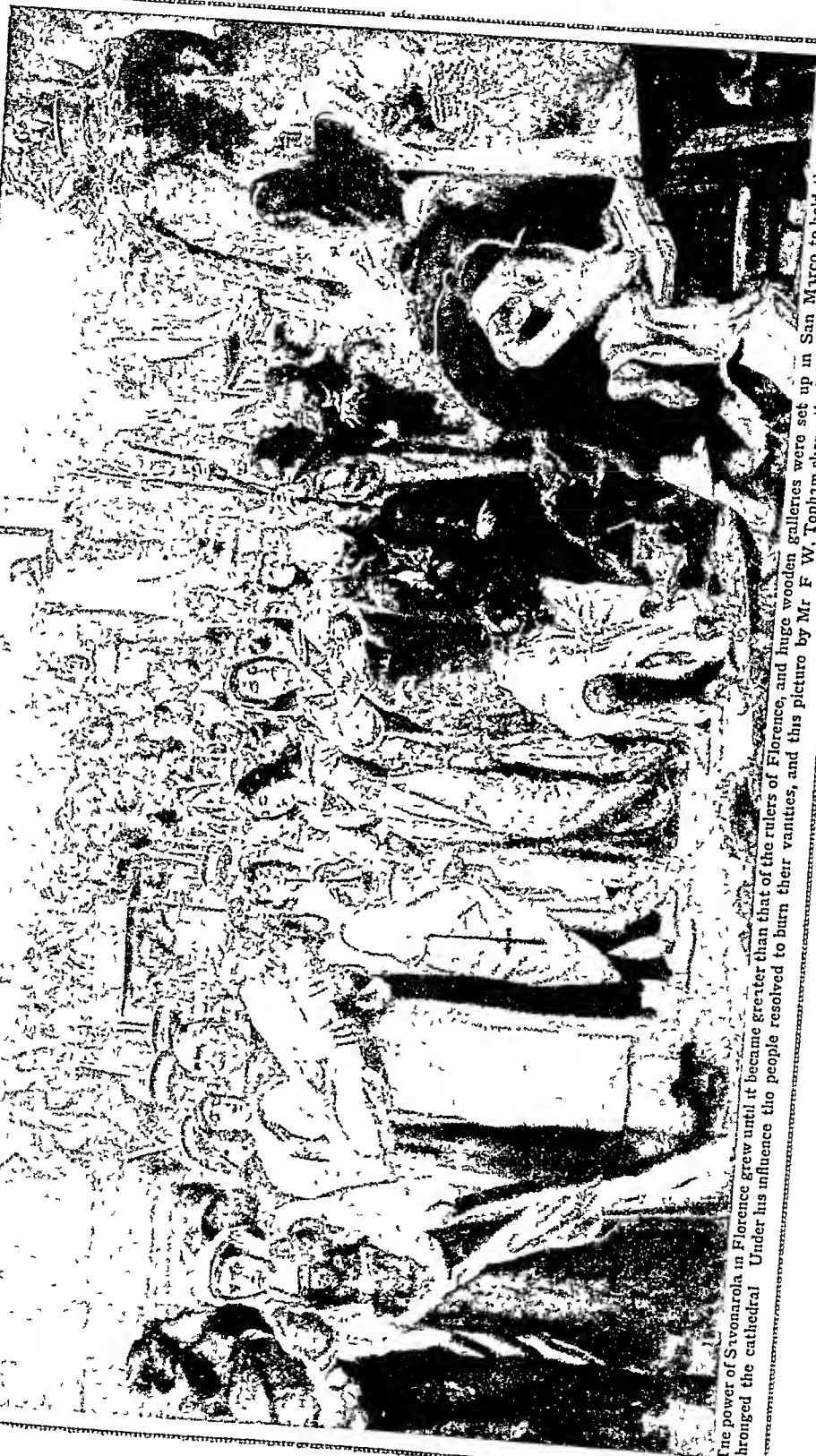
### DID MAN ALWAYS WRITE?

Writing is a form of speech, only written instead of spoken. But it is very much more difficult to learn, as we all know, and if we think for a moment, we shall see that it must have been vastly more difficult to invent. Indeed, a simple kind of speech scarcely required invention at all, for it could grow out of mere noises that meant pleasure, or anger, or distress. But writing requires invention. It needs people to agree with one another that certain marks shall mean certain things, and this is true even of things like that writing grew out of things like that anyone.

We do not doubt that, understand.



# SAVONAROLA'S FAMOUS BONFIRE OF VANITIES IN FLORENCE



The power of Savonarola in Florence grew until it became greater than that of the rulers of Florence, and huge wooden galleries were set up in San Marco to hold the crowds that thronged the cathedral. Under his influence the people resolved to burn their vanities, and this picture by Mr. F. W. Topham shows the burning of their "vain and unholy things."



SOME FAMOUS MONKS



and Athanasius against it." Again and again he was driven from his bishopric, again and again he returned. Once soldiers rushed in to take him at the altar. He showed no fear. This devoted son of the Church spent the periods of his exile in monasteries, and, during those weeks of quiet, wrote some memorable books. He was not a true monk, being more of a statesman than a parish priest; but his devotion to his ideas concerning Christ were of the most devout and sacred kind, and we owe it to the monasteries in Upper Egypt that some of those ideas have come down to us. Born about 296, Athanasius died in 373.

#### HOW A CHILD'S VOICE MADE A BISHOP IN A CITY CROWD

Of all the monks who ever lived, if he can properly be called a monk at all, the strangest is St. Ambrose. At the age of thirty-six, after a successful life as a lawyer, he became a governor, and lived in Milan. A dispute arose between two sects of the Church over the election of a bishop. There was a dispute in the church that was almost a war. Ambrose hurried to the scene, and made an earnest and eloquent appeal to the people for Christian behaviour. As he ceased speaking—so says the legend—an infant's voice suddenly cried out: "Ambrose is bishop."

The crowd took up the shout. In vain did Ambrose protest that he was a bad man and not fit at all to be a bishop; in vain did he try to escape. The whole city insisted, and the lawyer and governor, selling his goods and putting by his robes of state, became a Christian bishop. The day came when he showed his spirit. The powerful Emperor Theodosius ordered a massacre, and the slaughter had been carried out. Ambrose, shocked to the soul by this bloodthirsty outrage, wrote to the emperor, refusing to let him enter the church of Milan.

#### THE FEARLESS AMBROSE, WHO MADE AN EMPEROR DO PENANCE

The emperor replied that David had committed murder. "Imitate him in his repentance as well as his sin," answered the heroic bishop. For eight months the bishop kept the emperor at bay. Then, one day, the emperor's courtiers came to Ambrose and announced that the emperor was coming. "I will hinder him from entering the vestibule," said

Ambrose; "yet, if he will play the king, I will offer him my throat." When the emperor heard this, he said: "I will go and receive the refusal which I desire." But on meeting the bishop he said: "I come to offer myself to submit to whatever you may prescribe."

Ambrose then commanded him to do public penance, and in future—because his temper was ungovernable—to let thirty days run between the order for capital punishment and its execution. Ambrose was a just, fearless, and upright man, and his writings are those of a devout and fervent worshipper of God. Born about 340, Ambrose died in 397.

St. Jerome is interesting to us as the Latin translator of the Scriptures. He is also interesting by reason of the picture he presents to us of a man fighting what he considered a dreadful sin, namely, a love of books. Poor Jerome was a scholar, and he loved old books, and he could only be happy with venerable authors full of tales of long ago. But a day came when, brought by sickness to death's door, he reflected on the next world, and came to the conclusion that pagan literature was wicked.

#### JEROME, THE MONK WHO LOVED BOOKS AND FLED TO THE WILDERNESS

Before this time he had been a man who loved to take part in arguments about the Church; now he became a man who wanted to live the Christian life. He became a hermit, and lived in the wilderness. But in the wilderness there were books in a monastery there, and soon he was among his temptations again; he again became mixed up in violent arguments. Called to Rome to help in a dispute, he became a great favourite with ladies, and when he set out to the Holy Land, he was followed by a train of these admirers. They built three nunneries and a monastery, and Jerome settled down in this monastery at Bethlehem to write the Old Testament in Latin. Jewish Rabbis came to him by night to help him in his work.

But whenever an argument broke out in Rome, off flew Jerome eagerly, for he simply could not keep himself out of an altercation. He was like an Irishman, always spoiling for a fight. So violent was his manner that the monastery in which he stayed was attacked by furious enemies. To the end of his life Jerome

## TWO MONKS WHO FACED GREAT DANGERS



St. Basil here an English monk who can not Christ carry with us there and I do not go to the many things I  
it is hard to win these people for the truth. To go to that they are now as much as possible to go  
the earth look of Christ and here we see him full of soul, begging from the people to be his work.



70. It is also noted that the fact that the above information was not disclosed to the public in the past does not mean that it is not relevant to the public's knowledge. It is also noted that the fact that the above information was not disclosed to the public in the past does not mean that it is not relevant to the public's knowledge. It is also noted that the fact that the above information was not disclosed to the public in the past does not mean that it is not relevant to the public's knowledge.

was a scholar and a disputant. No wilderness and no monastery could ever have held this worthy man without books. He was a good man, and deserved his sainthood. Jerome was born about 342 and died in 420.

**THE ENGLISH MONK WHO TOOK CHRISTIANITY TO GERMANY**

It was a monk from England who, in the eighth century, carried Christianity to Germany. His name was Winfrid, and he was born probably at Kinton or Crediton, in Devonshire, the son of a West Saxon chieftain. At seven years he was sent to a monastery school in Exeter. The Pope saw him in Rome, took a fancy to him, gave him permission to go as missionary to the Germans, and changed his name to Boniface.

We get a quaint picture of the period in the scene which took place between Boniface and the heathen of Germany to decide between God and Woden. Boniface undertook to chop down their sacred oak. The heathen, thinking he would infallibly be struck down by their wrathful god, stood by to watch his destruction. The oak fell with a crash, Boniface did not. Whereupon the heathen embraced Christianity, and out of the oak Boniface built an oratory to St. Peter.

--But alas for poor Boniface! He was himself to taste the bitterness of a similar defeat. After a life of the most manifold and successful labours, after having converted thousands to Christianity, set up monasteries, built churches, and even crowned a king of France in the name of the Pope; after all this Boniface was attacked by a body of pagan plunderers, and, trusting to the relics of saints rather than to bows and arrows, he was miserably slain. The poor old man, frail and delicate, fell before the clubs of savage robbers, and died with the relics clasped in his hand. His life was one of the most useful, hazardous, and courageous ever lived by man, and England may be proud of her missionary. Boniface died in 755.

**ST. BERNARD, WHO DENIED HIMSELF PLEASURE AND GOOD AND FRIENDSHIP**

One of the most attractive monks in history is St. Bernard, called the "last of the fathers," so simple was he, so full of faith, so quiet of soul, so touched by the Spirit of Jesus. He was the son of a French knight, and as a boy drew

others to the religious life. He became a Cistercian monk, and set himself to kill all sense of enjoyment, all desire for pleasure in his own soul. He seldom took food till he was on the edge of fainting, and when friends came he would stop his ears with flax so that he might hear no worldly talk. This was in his boyhood.

Some time later we hear him saying of book-learning: "You will find something far greater in the woods than in books. Stones and trees will teach what masters do not know. Think you not you can suck honey from the rock, and oil from the flinty rock? Do not the mountains drop sweetness, the hills run with milk and honey, and the valleys stand thick with corn?"

He lived the most hard and desolate life, preaching repentance with a rare eloquence. When he was fifty-five, and worn to a thread, he was bidden bestir Europe for a second crusade. Pale and shrunken, to a degree which seemed almost supernatural, he made a long and exhausting tour of France and Germany, preaching with a success so great that in some districts scarcely one man was left to seven women.

**HOW THE GENTLE BERNARD SAVED THE JEWS FROM DEATH**

Behind this old man came a young monk stirring people up to massacre the Jews. Bernard turned back, reproached the monk as "a child of the devil," and sent him to his monastery. "Had not the tender mercy of the Lord sent priest Bernard, none of us would have survived," said a Jew. That such a tender and beautiful life of fervid piety should have been lived in the twelfth century is a glory of Christianity. St. Bernard was born in 1091, and died in 1153.

One aspect of St. Bernard brings us in contact with another and far different monk of that period, the man Peter Abelard. He is not a pretty character. Possessed of a brain that used logic as a boy uses a top, he gave himself up to disputing about the most ridiculous things in the world. He passed for a scholar of immense learning. His fame spread. He became a peacock of philosophy, a dandy of theology. He went from town to town airing his knowledge and refuting other teachers. In the height of his fame he fell in love with a girl he was engaged to teach, and

# THE TENDER ARTIST-MONK OF FLORENCE



One of the best-known pictures of the great artist is the one in which he is seated at his desk, writing or drawing, with a large sheet of paper before him. The figure is seated, and the figure is looking down at the paper. The figure is wearing a long robe, and the figure is looking down at the paper. The figure is seated, and the figure is looking down at the paper. The figure is wearing a long robe, and the figure is looking down at the paper.



The figure is seated, and the figure is looking down at the paper. The figure is wearing a long robe, and the figure is looking down at the paper. The figure is seated, and the figure is looking down at the paper. The figure is wearing a long robe, and the figure is looking down at the paper.



mained this Héloïse secretly lest he should be stopped from advancing in the Church. Then his enemies, stirred up by his pride, came about him. He was persecuted, and had on some occasions to flee for his life. He was accused of heresy. St Bernard was set to dispute with him. The poor old faded monk was bidden to stand in conflict with this great "scholar."

We are told that, hearing the eloquence of St Bernard, Abelard refused to argue, and appealed to Rome. Rome condemned him. He entered a monastery, sick of the world; his wife went into a nunnery. But his persecutions lasted almost to the day of his death. For Abelard condemned the wicked lives of the monks whose lot he shared, and these men made it hard for him. His reputation as a scholar, however, continued, but he was no longer the swaggering cockcomb seeking to dazzle and attract. He died a broken-hearted man, having spent his last years in writing rather cold and formal letters of religious instruction to his wife in the nunnery. Abelard lived from 1079 to 1142.

#### THE EXTRAORDINARY STORY OF ST. DOMINIC AND THE BLACK FRIARS

If every person who crosses Blackfriars Bridge in London knew how it came by that name, what a great multitude of people would know the extraordinary story of St Dominic! The name comes to us from one of the most terrible figures in the Roman Church—a Spanish priest known as St Dominic. He began life with a beautiful and earnest devotion to Christ. As a boy he prayed often; at the university he sold his clothes in a time of famine to feed the poor, and offered to go as a slave to Morocco in place of a poor woman's brother who had been captured by the Moors. He was ordained a priest, and soon became known for the rigour of his life and the eloquence of his preaching. So far Dominic was an earnest son of the Church. But a day came when he went on a mission to Denmark, and no sooner had he left Spain, where the people feared and obeyed the priests, than he found himself among people of a vastly different character. Shocked by their disobedience, by their heresies, and by the manner of their life, Dominic set himself to reform or punish them.

Meeting a magnificent cavalcade from Rome on the same mission, he exclaimed: "How can you expect success with all this secular pomp! These men cannot be touched by words without corresponding deeds. Throw aside your splendour, and go forth as the disciples of old, barefoot, without purse or scrip, to proclaim the truth."

#### THE CRUEL MONK WHO FOUNDED THE HORRIBLE INQUISITION

Dominic practised what he preached, and became a barefooted, black-robed, mendicant friar—a black friar—and set out to convert these disobedient children. But, alas! success did not attend his efforts, and he had to say at last: "I have spoken to you with tenderness, with prayers, with tears; but, according to the proverb of my country, where the benediction has no effect, the rod may have much. Behold how we rouse up against you princes and prelates, nations and kingdoms, and many shall perish by the sword!"

Enthusiasts claim for him the unspeakable infamy of having set up the Holy Inquisition—the blackest tyranny that ever tortured and slew men and women and children in the name of God. We see how a man, beginning with the purest saintliness, the most devout and simple piety, may become a very fiend in the cause of righteousness. Dominic, apart from this Spanish fury and intemperance, was a man of no little genius and much faith. He was born about 1170 and died in 1221.

#### ROGER BACON, THE ENGLISHMAN WHO WAS SAID TO KNOW EVERYTHING

A great scholar-monk was our English Roger Bacon—"the miracle of the age he lived in." He was said to know everything. He marks for us an interesting place in human history. From the days of Archimedes, about 300 B.C., to the days of Roger Bacon, about 1200, science is dumb. Fifteen centuries of silence! We shall never catch up those lost 1,500 years. Roger Bacon was the first man to break the long silence. This friar studied chemistry and astronomy. Under one Pope he was allowed to work unmolested. But soon his knowledge gave offence, he was cast into prison in France, and only came out to drag his weary way to England, where he soon died—one of the many martyrs of science. Religion nowadays



Fra Angelico's work at Fiesole is important to us in England, for we are fortunate enough to possess a specimen of it in our National Gallery. It is a magnificent painting of Christ bearing the banner of the Resurrection, attended by a host of saints. This picture serves to show how industrious Fra Angelico was, for in it no fewer than 266 figures of saints are drawn. After he had been nine years at Florence, Fra Angelico was summoned by the Pope to Rome. The Pope had heard of the painter's godly life as well as of his work as an artist and wished to make him Archbishop of Florence.

#### HOW THE HUMBLE FRIAR REFUSED HONOUR AND DIGNITY

The painter was as modest as he was good and skilful. He prayed the Pope not to make him accept the dignity, and the Pope permitted him to remain a humble friar, and appointed instead a friend of Fra Angelico. In 1445, and again in 1455, Angelico worked in the Vatican. He died in Rome in the latter year, and there he was buried.

There never was a more beautiful life than that of Fra Angelico. He laboured with all his zeal for the poor, who regarded him as a brother. He regarded his ability to paint as a gift from God. When he wished to paint he used to kneel and pray. Then he rose and did the work upon which he had set his mind. What he had once painted he never altered.

Fra Angelico felt that everything he did as an artist was in answer to his prayers, and that therefore it must stand, as of too holy an origin to be touched up or improved. Religion was to him his hope and joy, and he tried to lead others to share his rapture by the most beautiful paintings of heavenly beings, and by presenting, with all his tender genius, the stories of the Bible. He painted the sorrows of Jesus as well as His triumphs. These were sad days in the life of Fra Angelico, and he would weep bitterly as he painted the Crucifixion.

#### SAVONAROLA, THE GREAT MONK WHO MADE KINGS TREMBLE

Savonarola is one of the picturesque figures of the Middle Ages. In the midst of that gorgeous, wicked, and careless period, we see the shrunken figure and the gaunt face of a little

hooded man, whose glowing black eyes, flashing judgment and anger, glance like lightning on the crowd from under the shadow of his cowl. He was terrible to sin. Rulers feared him, wicked people maligned him, and the populace was swept like a sea by the tempest of his preaching. He came from his monastery to chastise the world. The world accepted the conflict. Savonarola was raised high in honour, then tried, tortured, hanged, and burned. His ashes were thrown into the river.

Such, in brief, is his history. When we look more closely at this great figure we are puzzled by many things. Some people would have us believe that scarcely a greater hero ever crossed the earth; others that he was perhaps the grossest impostor who ever lived. To-day men read history not to take sides in a fight, but to see the truth of things. Savonarola appears to us now a strange mixture of nobility and delusion. We call him a hero, we cannot call him an impostor, but we can criticise him.

He seems to us not a man who sought to deceive, but was himself unconsciously deceived. He believed, for instance, that evil spirits came and wrestled with him in his cell; that the Holy Spirit settled on his shoulder in the form of a dove, and spoke in his ear through the dove's beak; he declared that he conversed with God. He saw visions of the most frightful and appalling description.

#### HOW THE SEVERE LIFE OF SAVONAROLA AFFECTED HIS THOUGHT AND ACTION

All this, in our day of calm reason and medical knowledge, assures us that the hero-like soul of this good man was afflicted by the distempers of his brain. The preacher who sways a multitude needs a cool head. The severe discipline practised by Savonarola—his brief hours of sleep, his long prayers, his sparing food, his deficiency of healthy physical exercise—unfitted him for meddling in politics. He was certainly a very dangerous man.

But his courage was magnificent. His hatred of vice and luxury was most honest. The wickedness of the Court of Rome hurt his noble soul to the quick. If ever a man felt the sharp contrast between the simplicity of Jesus and the magnificence of His Church, it was this fiery prophet of Florence. As he passed to the gibbet

# THE LAST COMMUNION OF SAINT JEROME



ST. JEROME DYING IN THE DESERT BY J. M. W. TURNER



ST. JEROME DYING IN THE DESERT BY J. M. W. TURNER

on which he was burned—in sight of the beautiful cathedral shown on page 2781, where great crowds had flocked to hear his preaching—a bishop said:

"I separate thee from the Church militant and the Church triumphant."

"Not from the Church triumphant," replied the monk, with quiet confidence, "that is beyond your power."

#### A PROTESTANT WHO REMAINED A MONK OF THE ROMAN CHURCH

Protestants have claimed him for a martyr, but he appears to have adored the Sacrament before his death, and to have confessed himself a true son of the Roman Church. Savonarola was born in 1452, and died in 1498.

The famous portrait by a fellow monk, Fra Bartolommeo, is given in the group on page 3981. It was painted from life, and the original still hangs in Savonarola's cell at the monastery in Florence.

In 1491 there was born in a Spanish castle a boy destined to become one of the most famous men who ever threw off the world to put on the monk's hood. This was Inigo Lopez de Recalde, known to history by his monk's name and his Roman sainthood, as St. Ignatius de Loyola. He was a nobleman, and grew up on his father's estate without learning of any kind. He became a page in the court of Ferdinand, and, later, embraced the profession of arms. While following the calling of a soldier, he was severely wounded in the right leg at the siege of Pampeluna. While he lay in his father's castle recovering himself of this wound, certain books of religion, given to him to while away his idleness, laid a hold on his soul.

#### THE SPANISH SOLDIER WHO FOUNDED THE ORDER OF JESUITS

When he rose from the bed it was to journey to a church, where he hung up his soldier's arms, and vowed himself to live a religious life. He removed himself to a hospital, and worked in menial offices to learn humility. Then he journeyed to Jerusalem, and came back inspired with the idea of founding a new religious society. He put himself to school to learn. While learning he began to influence men. Directly he stated his simple views, however, the hand of Rome came down upon him, and he had to flee. From city to city he went; begging his way, until at last in Paris he found freedom, and there

he lived as a mendicant. At the university his persuasive powers drew certain young men to his side, and at the age of forty-six he was ordained, and set out on his preaching mission.

The edible miracles have been ascribed to Loyola. Even in our own day a book has been published concerning a modern Ignatius, lately dead, professing that he raised people from death, and many other wonderful things; these foolish stories will always be written of remarkable men who give themselves up to a romantic mode of life.

The miracle of Loyola lies in his creation of the Jesuits, a society spread all over the world, and working in many languages to one and the same end.

For a man who was not ordained until he was nearly fifty, and who was fighting at the age of thirty, this is a most remarkable achievement. Loyola is not responsible for the political power which his society soon gathered. His influence was purely spiritual.

#### THE WONDERFUL POWER THAT LOYOLA HAD OVER MEN

He drew men to him by the force of his holiness. It is narrated of him that while in Paris he sought to gain the affection of a young student named Xavier, who withstood all the earnest advances of the religious zealot.

One day Xavier, having done well in the class for philosophy, was strutting about in great pride, when Ignatius came to his ear and whispered, "What shall it profit a man if he gain the whole world and lose his own soul?" Xavier was converted, and became the famous St. Francis Xavier of the Jesuits. Such was the real power of Ignatius—a personal influence on the side of holiness. Loyola died at Rome in 1556, utterly worn out by his labours and his severe mode of life.

The distinguishing feature of the Jesuit Order is that the members do not retire from the world and shut themselves up within the forbidding walls of a monastery, where they know little or nothing of the busy world, and the busy world knows little and cares less about them. They remain very much in the world, and are active in the homes of men, in the parliament of nations, and in the councils of Rome. They are monks of the world.

The next Men and Women begin on 4053

# The Child's Book of FAMILIAR THINGS



We should be very thankful that there was any comparison between the palm and the rope. If  
 here we see rope growing in the eye of a palm. The kind of rope is made from the leaves of a  
 grove at Sals, in Yucatan. There are many and more of these groves in the State.

## A PIECE OF ROPE



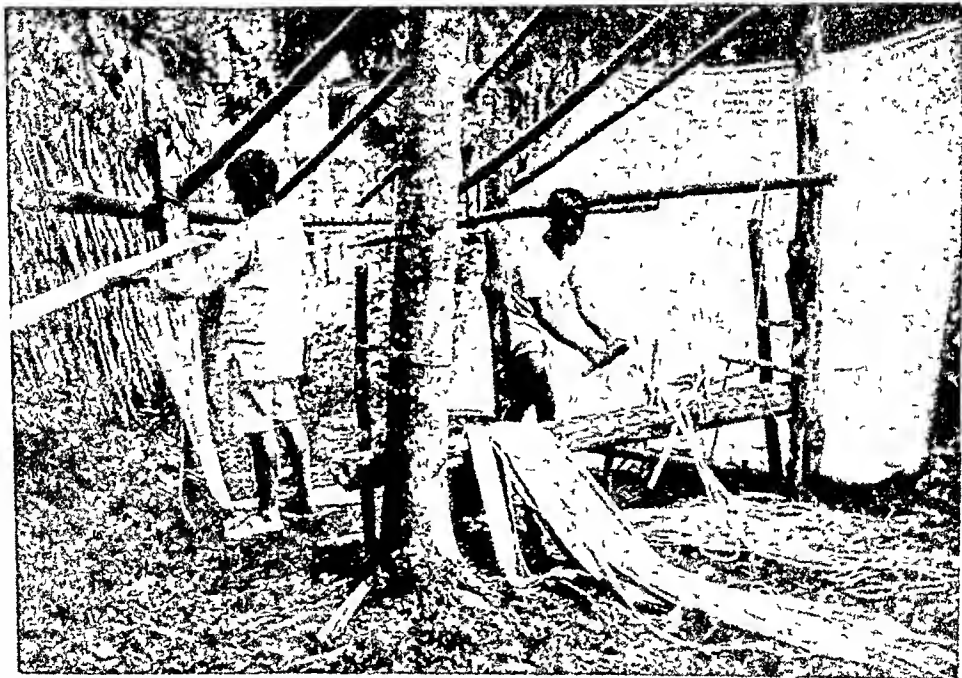
# GETTING THE HEMP READY TO MAKE ROPE



Manilla hemp, which grows in the Philippine Islands, differs very much from the Sisal hemp, shown on page 3091. Sisal hemp is something like mammoth grass, but Manilla hemp is taller and looks like a palm

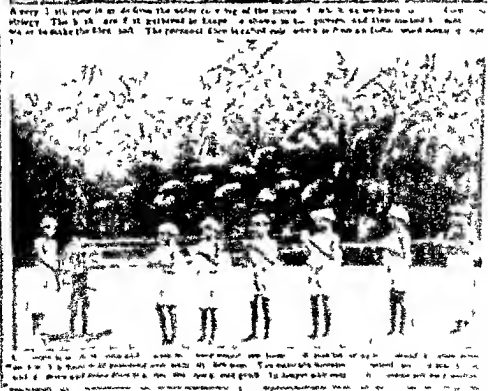


The leaf-stalks of the hemp are stripped from the trunk, and then the natives of the Philippine Islands split the stems into lengths two or three inches wide, using a kind of bamboo knife, as seen in this picture.



After being stripped and split the hemp-stalks are scraped, as shown here, until only the fibre remains. Then this fibre is washed and dried, and packed into bales ready to be sent all over the world. Two men working all day can prepare 25 pounds of hemp, and it takes 3,000 trees to produce a ton of hemp, worth from £25 to £75.

## MAKING ROPE FROM COCOANUT SHELLS

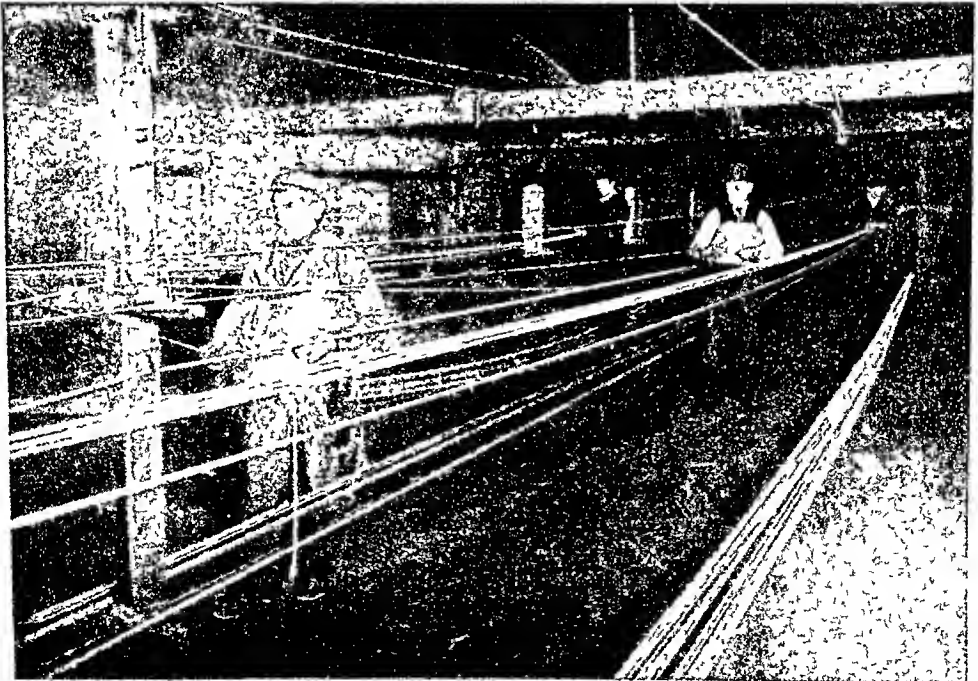




# THE OLD WAY OF MAKING ROPE BY HAND



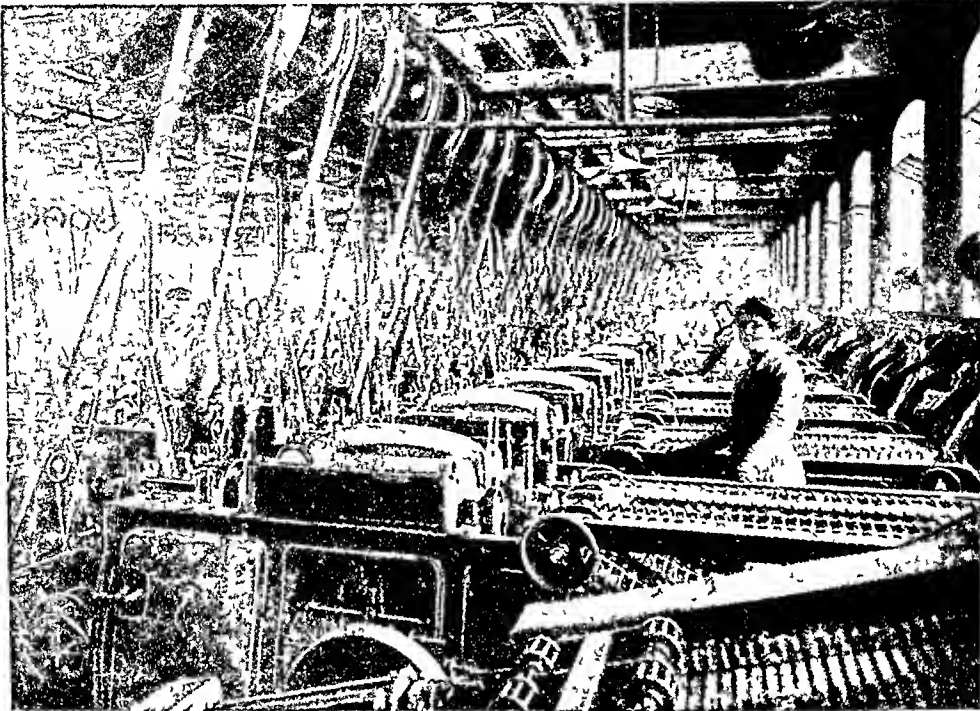
The old-fashioned way of making rope by hand is fast dying out, although it still exists in some small rope-works. Here we see the men coming out the hemp by drawing it through a series of long spikes fixed into boards that look something like inverted rakes. The men work quickly, but it takes a long time to prepare a ton of hemp by hand.



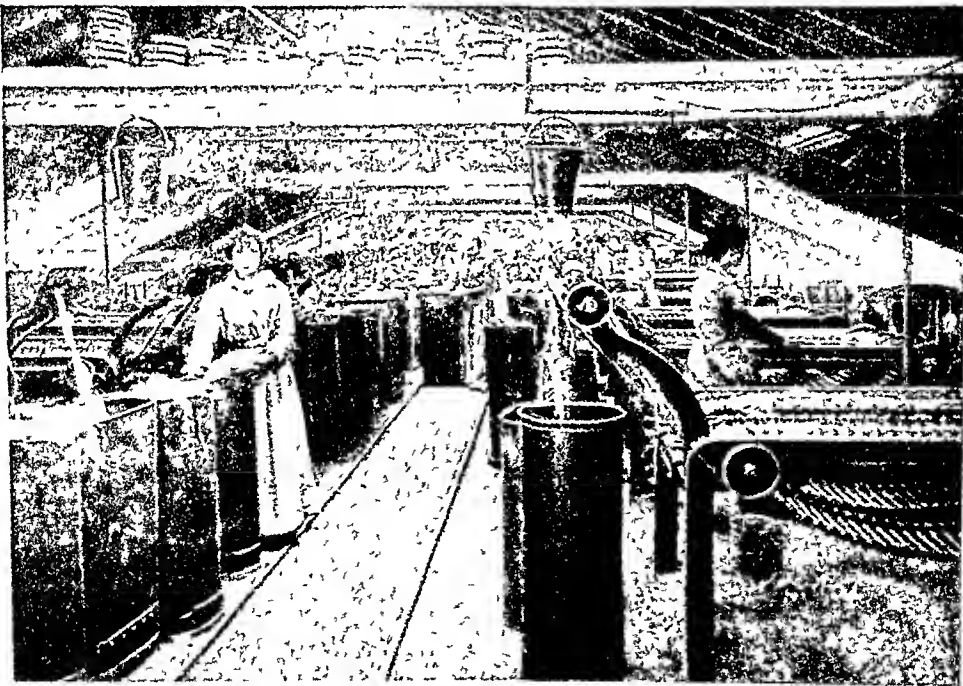
Here we have an old-fashioned rope-walk, but there are not many places in England to-day where we can see a scene like this. The method is very much like that of the natives shown on page 2093, each fibre being added by hand, and the workers become wonderfully expert and quick in making ropes of the same thickness from end to end.



## SPINNING THE HEMP INTO ROPE AND TWINE



In this room twine for fishing-nets is being made, and there are 150 spinning machines at work. If we went into the room, we should be deafened by the whirring of the wheels, but the workers get used to the noise.

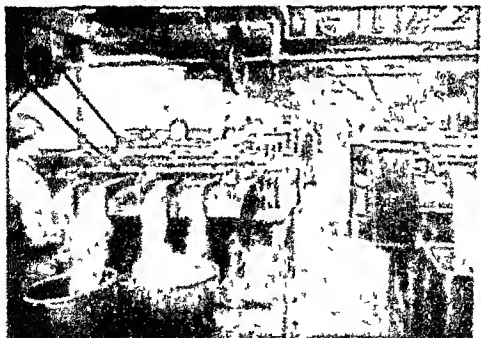


Here we see Russian and Italian hemp being spun into rope. More than a hundred years ago, Dr. Edmund Cartwright, who invented the power-loom for cotton-weaving, made a rope-spinning machine which he called a cordeller, and it is really on this that all the magnificent modern machinery for rope-making is based. Cartwright received £10,000 from Parliament for his inventions, which had added greatly to the prosperity of the British nation.

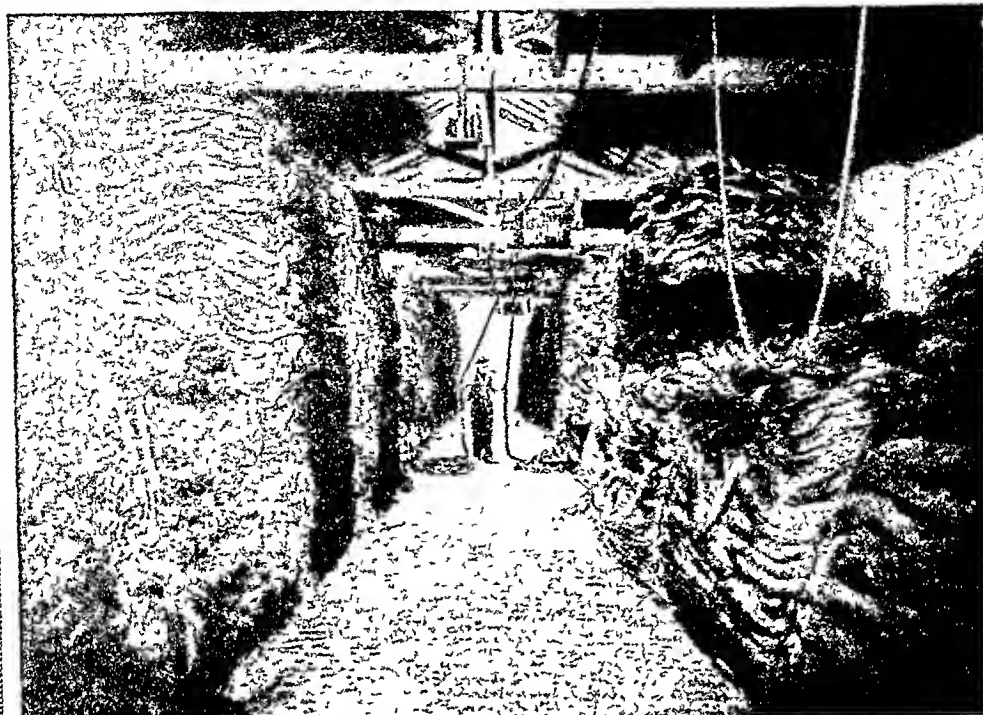
## 'COMBING OUT THE TANGLED HEMP



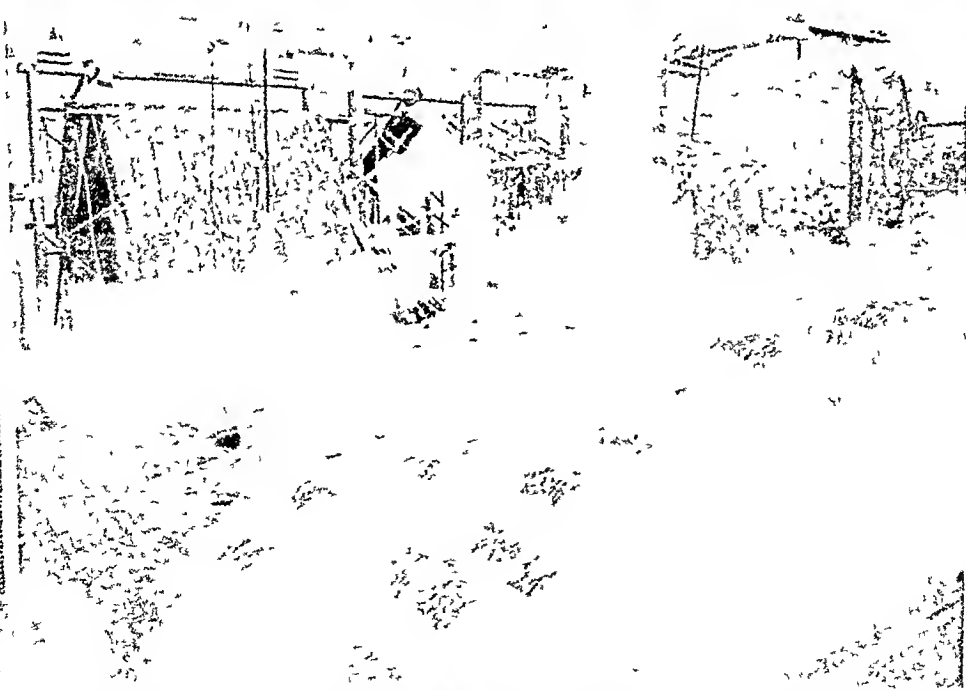
When we are given a value of  $\mu$ , such as  $\mu = 10$ , we can use the normal distribution to find the probability that  $\bar{X}$  will be greater than 10. This probability will be the same as the probability that  $Z$  will be greater than 0, which is 0.5.

[illegible]

# WINDING AND STORING THE TARRED YARN



A great quantity of yarn, or hemp fibre, is tarred ready to be made into tarred rope; and in this store we see 150 tons, or 330,000 pounds, of the tarred yarn waiting to be wound on to spools, or reels.

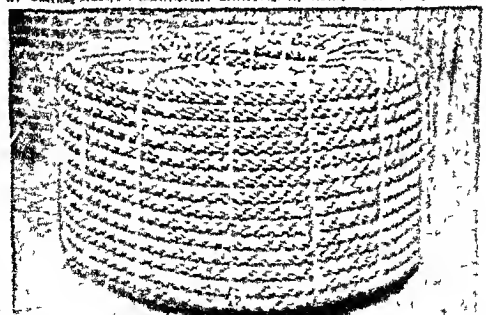


Now the tarred yarn is wound on to huge spools before being spun into a rope. In the foreground the full spools, to the left of the post are some spools just ready to be lifted from the winding, and on the right are some empty spools just being filled. The spools are wound twelve at a time.

# THE ROPE FINISHED AND READY FOR USE



There is a great big rope with, instead of one or two strands, the length of the rope is 100 ft. (approx.) the diameter is 12 in. and the weight is 100 lb. (approx.) 100 ft. of rope can be made in a single day. The rope is 100 ft. long.



The rope is 100 ft. long and 12 in. in diameter. It is made of 100 strands of 1/2 in. rope. The rope is 100 ft. long and 12 in. in diameter. It is made of 100 strands of 1/2 in. rope. The rope is 100 ft. long and 12 in. in diameter. It is made of 100 strands of 1/2 in. rope.

## PRINCESS MAYBLOOM AT THE FOUNTAIN



After travelling for some hours, they reached the place, and, sitting down, Princess Maybloom pulled off her stockings and dipped her feet into the marvellous fountain. The moment her feet touched the water they grew less



## THE STORY OF FAIRYFOOT



the little man "We lead the merriest lives in the world, and care for nobody's feet, but there are two things you must mind—first, do as you see the rest doing, and, secondly, never speak of anything you may hear or see."

"I will do that, and anything more you like," said Fairyfoot, and the little man taking his hand, led him over the pasture into the forest, and along a mossy path among old trees wreathed with ivy, till they heard the sound of music, and came upon a meadow where the moon shone as bright as day, and all the flowers of the year bloomed together in the thick grass. There was a crowd of little men and women, some clad in russet colour, but far more in green, dancing round a little well as clear as crystal. And under great rose-trees, which grew here and there in the meadow, companies were sitting round low tables covered with cups of milk, dishes of honey, and carved wooden flagons filled with clear red wine.

The little man led Fairyfoot to the nearest table and bade him drink. Immediately the red wine touched his lips, all his troubles seemed to leave him, and the little people about the well cried "Welcome! welcome!" and every one said "Come and dance with me!" So Fairyfoot was as happy as a prince, and drank milk and ate honey till the moon was low in the sky, then the little man took him by the hand and led him back to his own bed of straw in the cottage corner.

Next morning Fairyfoot was not tired for all his dancing. Nobody in the cottage had missed him, and he went out with the sheep as usual, but every night all that summer, when the shepherds were safe in bed, the little man came and took him away to dance in the forest.

The wonder was that he was never tired or sleepy, as people are apt to be who dance all night, but before the summer was ended, Fairyfoot found out the reason. One night, when the moon was full, Robin Goodfellow came for him as usual, and away they went to the flowery green. The fun there was high, and Robin was in haste. So he only pointed to the carved cup from which Fairyfoot every night drank the clear red wine.

"I am not thirsty, and there is no use losing time," thought the boy, and he

joined the dance; but never in all his life did Fairyfoot find it such hard work to keep pace with the company. Fairyfoot did his best, but at length he was glad to steal away, and sit down behind a mossy oak, where his eyes closed for very weariness. When he awoke, the dance was nearly over, but two little ladies clad in green talked close beside him.

"What a beautiful boy!" said one of them. "What handsome feet he has!"

"Yes," said the other, "they are just like the feet Princess Maybloom had before she washed them in the Growing Well, which has now dried up. Nothing in this world can make them small again, you know."

When they were gone, Fairyfoot could sleep no more for astonishment. It amazed him that Princess Maybloom's father should be troubled at hers growing large. Besides, he wished to see that princess and her country. All that day he was so weary that he got into sad disgrace with the shepherd for neglecting his sheep. The old man beat him so cruelly that he determined to run away.

So on and on he ran, far into the forest, until at last, utterly exhausted, he sank down at the foot of a tree and fell fast asleep. When he awoke, he heard voices.

"What boy is this?" said a nightingale on a branch above him. "He cannot have come from Stumpinghame with such small and handsome feet."

"No," said another, "he has come from the West Country. How in the world did he find the way?"

"How simple you are!" said a third nightingale. "What had he to do but follow the ground-ivy which grows over height and hollow, bank and bush, from the lowest gate of the king's kitchen-garden to the root of this rose-tree?"

Fairyfoot was greatly astonished at this conversation, and thought it might be as well for him to follow the ground-ivy, and see the Princess Maybloom. It was a long journey, but he found the gate at last, and walked through the garden, till a white fawn came frisking by, and he heard a voice saying sorrowfully

"Come back, come back, my fawn! I cannot run and play with you now, my feet have grown so heavy." And,



as if someone were striking the keys at random. When the door was opened, Goila was found standing on his hind legs, with his two fore-paws pressing here and there on the keys, the response from which was evidently to his intense delight. The hint was enough.

The children taught him with assistance, of course, to pick out "Hady'n's Hymn," not at all badly. He was a religious doggie, as he never ventured to utter a note during the Sunday evening hymn. But the greatest fun was when a German band came round to the street. The moment Goila heard the toot-toot he ran to the band with the keenest enjoyment. He jumped round the somewhat resentful musicians, howled and pranced approval or otherwise, and

if, perchance, which was often the case, an inept or careless instrumentalist played a wrong note, Goila rushed at his heels. In fact, he became so unwelcome a critic that the band very soon ceased to come to the street.

He had social instincts. His most curious friendship was that with a tortoise. When the latter became accustomed to the dog, it put out its head from its shell, and allowed Goila to lick

it. There was a step leading from the kitchen to the scullery, and another from the scullery to the back garden. When the tortoise wished to take its walks abroad, Goila would carefully assist it down the steps, and watch it with curious interest searching for and eating lettuce. But Goila's love for his mailed friend was the undoing of the latter. When autumn came, the tortoise dug a hole in the garden soil in which to sleep through the winter. Goila smelt him out, and excitedly rescued his friend from premature burial. From cold and want of his winter sleep the tortoise died.

Goila was a wonderful retriever either of children's boats or caps on the lake, or of articles artfully hidden in holes

or beneath stones. He had cunning distinctions as to what was fair game. Early in the morning after a first day's stay in the schoolhouse of a Highland village, Goila was found to have brought to the kitchen door a rabbit and a partridge. We wished to live at peace with the gamekeeper, and solemnly admonished Goila never to bring in another bird; we soothed our conscience by telling the dog that rabbits were vermin. Never another bird was found on the doorstep, but, truth to tell, there was occasionally rabbit-pie for dinner.

How long does a dog's memory remain fresh? It is hard to say. The writer had occasion to go abroad. Although Goila was supposed to be locked up when he left home to take the train for



THE DOG STOPPED AND PRICKED HIS EARS

London, the dog came tearing along the departure platform as the guard gave the signal for the start, and was last seen galloping at a great speed and howling furiously as the train disappeared in the darkness of the night. Some days afterwards he returned home, foot-sore and with a ragged coat. The dog was disconsolate, he lost all interest in his old home and its inmates, and after a few weeks disappeared.

Seven years elapsed, and the writer returned to this country. One afternoon, a month afterwards, in the southern district of his own town—Edinburgh—he saw Goila trotting at the tail of a butcher's cart. Merely on the off-chance of a recognition, he called out "Goila!" The dog stopped, pricked up his ears, gave a wild yelp of delight, circled round and round, leaped up with his fore-paws on the shoulders, and licked the dearly-loved face of his old master.

But the new joy was short-lived. A very few months passed, when Goila disappeared as if it had all been a dream, and, despite every inquiry by advertisement and otherwise, he was, to our great sorrow, heard of no more.



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THE LITTLE MAIDEN OF THE LAKE  
THE STORY OF BRITHA AND UNDINE

She took him into the enchanted forest, and mounted on his own horse showed him wonderful and magic things. The more the knight spoke to her, the more he felt the wonder and charm of this wild maiden. At last, so greatly did he admire Undine that he proposed marriage to her, and it was agreed that they should soon be married.

And now the true story of Undine must be told. When the fisherman's daughter fell into the lake, the fairies decided to give the old couple another daughter, and Undine was sent to them. She was a water-nymph, and, like all

not very much better that we should never receive such a wondrous gift?"

The beautiful maiden, who loved Nature, felt that to possess a soul meant something dreadful in her life. It was a great gain, but it entailed a terrible loss. She would become immortal, but first she would have to taste the cup of human grief and mortal pain. Nevertheless, so great was her love for Hildebrand that she knelt meekly before the priest, and in prayer became a human being.

Her nature seemed to change at once. She became grateful to her foster-



UNDINE SHOWED THE KNIGHT MANY MAGIC THINGS IN THE ENCHANTED FOREST

other creatures of that kind, possessed no soul. Her father wanted her to have a soul, and so he sent her to become a human being. Because the old fisherman and his wife were bereft of a daughter, Undine was sent to them.

When the priest came to marry Undine, he was surprised by her wild ways, and spoke seriously to her about the soul. At first she only laughed, but, after hearing the prayers of the priest, she said:

"There must be something beautiful, but, at the same time, extremely awful, about a soul. Tell me, holy sir, were it

parents. A great and inexpressible tenderness took the place of her old wilfulness. She was loving and helpful to the fisherman and his wife. She showed her husband the depth of a nature to which love was all in all.

For some little while Undine was supremely happy. But as she was journeying with her husband and her foster-parents to Hildebrand's castle, they stayed at the castle of another great lord, whose adopted daughter was the proud Bertha once loved by Hildebrand. It was revealed to Undine that this Bertha was the daughter

of the fisherman and his wife who had fallen into the water. One day she sang a beautiful song about Bertha's real parents, and Bertha was melted into tears.

Oh Undine she exclaimed show me my parents that I may go and love them! But when Undine rejoined

Dearest Bertha, these are your parents, the proud da nsel vowed that she could not possibly be the daughter of a fisherman, but marks on her shoulder and foot proved that she was the fisherman's daughter and she burst into angry tears, being advised of her poor parents.

Undine was sorry for the part she had  
and persuaded Hildebrand to make a letter  
to their castle. When they arrived there  
Bertha set herself to rescue Hildebrand's  
love and presently made the husband  
crude to his wife. I will explain what  
happened that sometimes dreadful would  
happen if he saw the cruel words to her

But Bertha was always missing Hilbrand more and more away, and under. At last one day as they were sitting on the Durable Hillstead spoke more anxiously than ever to him to "Alas sweet heart" the father

thus farewell and vanished over  
the side of the vessel. As the waves  
began to cry out: Oh, were we!  
Oh, remain true! Oh, were!

Some time after the disappearance ofoline Hildbrand married Fritz. The wedding ceremony, however, was one of the deepest gloom. He had retired early to his room. As he tried to be a minute he heard a tap at his door which seemed to him ofoline's entrance. Then he heard a voice. Then in the room he saw a dark, menacing, & wicked, and a white figure glided into the room. He late not, but he felt a extraordinary

Don't make my nation that a  
one-fifth of the world. It's a nation  
far behind that of the rest of the  
world. But the rest of the world is not  
the same as the rest of the world.  
The rest of the world is not the same  
as the rest of the world.

In the river where the  
train was hit, a car was  
filled with water. The  
water was so deep that  
it was impossible to see  
the bottom.

## LA PLUS SAGE FILLE DU WLSSEX

[ La nuit au ciel étoilé la lune  
 apparaît. Et à gauche l'aube  
 brille dans un nuage blanc et  
 se reflète sur l'eau. Le vent  
 souffle et les vagues se  
 brisent sur la rive. Le  
 soleil se lève et le jour  
 commence. Les oiseaux  
 chantent et les fleurs  
 s'épanouissent. La vie  
 reprend son cours. ]

I have been thinking of you a great deal lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you. I have been thinking of you a great deal lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you.



# THE FABLES OF ÆSOP THE SLAVE

## THE GOAT AND THE LION

## THE TWO FROGS

A LION one day saw a goat upon a steep, craggy rock, where he could not climb up to him, so he said "What pleasure can you possibly find in jumping from one rock to another all day, and risking your neck every moment? I wonder that you do not come down here and feed in the meadow, where there is plenty of fresh, sweet grass"

"Well," replied the goat, "what you say may be very true, but, to tell you



the truth, you look so uncommonly hungry and fierce that I do not care to take the risk and venture too near you"

*Beware of the advice of people who want to gain something from you*

## THE CROW AND THE PITCHER

A CROW, almost dying with thirst, found a pitcher, or tall jug, which had



a little water in the bottom. Unfortunately, the crow was not able to reach the water. Again and again he tried, but without success. Then he tried to knock the pitcher over, so that he might get at the water; but he was not strong enough for this.

At last he noticed a quantity of little pebbles lying about. After much trouble and labour he gathered these together, and, dropping them into the pitcher one by one, he at last raised the water up to the brim, and so was able to drink

*Where there's a will there's a way*

ONE hot summer, when the country was parched and the lakes and ponds had nearly all dried up, two frogs were



travelling together in search of water. At last they came to a deep well, and, sitting upon the edge of it, began to discuss whether they should jump in. One of them was in favour of doing so, urging that there was plenty of clear water and no danger of being disturbed; but the other thought for some time, and then answered "That is all very well, but I do not care to jump in, because if the water should happen to dry up here, how shall we get out again?"

*Always look before you leap*

## THE LION AND THE FOUR BULLS

FOUR bulls who were great friends always kept near one another and fed together. A lion had often watched them, and wanted to kill one for his dinner. But he was afraid to attack all four together, knowing that they would defend one another. So he began by telling one of the bulls stories about the others to arouse jealousy and bad feeling among them.

The result was that the four bulls quarrelled and no longer went about in company. They separated and roamed



alone. Then the artful lion was able to kill and devour the bulls one at a time.

*Remember that union is strength*

The Child's Book of  
GOLDEN DEEDS



THE PEASANT AT THE FLOOD

O happy love ! where love like this is found !  
O heart felt raptures ! bliss beyond compare !  
I've paced much this weary mortal round,  
And sage experience bids me this declare  
"If Heaven a draught of heavenly pleasure  
spare,

One cordial in this melancholy vale,  
'Tis when a youthful, loving, modest pair,  
In other's arms breathe out the tender tale  
Beneath the milk-white thorn that scents the  
evening gale "

Is there, in human form that bears a heart,  
A wretch, a villain, lost to love and truth,  
That can, with studied, sly, ensnaring art,  
Betray sweet Jenny's unsuspecting youth ?  
Curse on his perjur'd arts ! dissembling  
smooth !

Are honour, virtue, conscience, all exil'd ?  
Is there no pity, no relenting ruth,  
Points to the parents fondling o'er their  
child,  
Then paints the ruin'd maid, and their dis-  
traction wild ?

But now the supper crowns their simple board  
The halesome parritch, chief o' Scotia's  
food,

The soupe their only hawkie does afford,  
That 'yont the hallan snugly chows her  
cood,

The dame brings forth in complimentary mood,  
To grace the lad, her weel-hain'd kebbuck  
fell,

An' aft he's prest, an' aft he eas it guid,  
The frugal wife, garrulous, will tell,  
How 'twas a townmond auld, sin' 'hint was i'  
the bell.

The cheerfu' supper done, wi' serious face  
They round the ingle form a circle wide  
The sire turns o'er, wi' patriarchal grace,  
The big ha'-Bible, ance his father's pride  
His bonnet rev'rently is laid aside,  
His lyart haffits wearing thin an' bare.  
Those strains that once did sweet in Zion  
glide,

He wales a portion with judicious care,  
And "Let us worship God !" he says, with  
solemn air

They chant their artless notes in simple guise,  
They tune their hearts—by far the noblest  
aim !

Perhaps Dundee's wild warbling measures  
rise,

Or plaintive Martyrs, worthy of the name,  
Or noble Elgin beats the heavenward flame,  
The sweetest far of Scotia's holy lays  
Compar'd wi' these, Italian trills are tame,  
The tickled ears no heart-felt raptures raise,  
Nae unison hac they wi' our Creator's praise

The priest-like father reads the sacred page,  
How Abram was the friend of God on high,  
Or Moses bade eternal warfare wage  
With Amalek's ungracious progeny,  
Or how the royal bard did groaning lie  
Beneath the stroke of Heaven's avenging  
ire,

Or Job's pathetic plaint, and wailing cry,  
Or rapt Isaiah's wild, seraphic fire,  
Or other holy scraps that tune the sacred lyre

Perhaps the Christian volume is the theme  
How guiltless blood for guilty man was  
shed,

How He, who bore in Heaven the second  
name,

Had not on earth whereon to lay His head -  
How His first followers and servants sped ;  
The precepts sage they wrote to many a  
land

How he, who lone in Patmos banished,  
Saw in the sun a mighty angel stand,  
And heard great Bab'lon's doom pronounc'd  
by Heaven's command

Then kneeling down to Heaven's Eternal  
King,

He saint, the father, and the husband  
prays

Hope "springs exulting on triumphant  
wing,"

That thus they all shall meet in future  
days

There ever bask in uncreated rays,  
No more to sigh, or shed the bitter tear,  
Together hymning their Creator's praise,  
In such society, yet still more dear,  
While circling time moves round in an eternal  
sphere

Compar'd with this, how poor Religion's pride,  
In all the pomp of method, and of art,

When men display to congregations wide  
Devotion's ev'ry grace, except the heart !

The Power, incens'd, the pageant will desert,  
The pompous strain, the sacerdotal stole,

But haply, in some cottage far apart,  
May hear, weel pleas'd, the language of the  
soul,

And in His Book of Life the inmates poor  
enrol

Then homeward all take off their sev'ral way .  
The youngling cottagers retire to rest ,

The parent pair their secret homage pay,  
And proffer up to Heav'n the warm re-  
quest,

That He who stills the raven's clam'rous nest,  
And decks the lily fair in flow'ry pride,

Would, in the way His wisdom sees the best,  
For them and for their little ones provide ,

But, chiefly, in their hearts with grace divine  
preside

From scenes like these old Scotia's grandeur  
springs,

That makes her lov'd at home, rever'd  
abroad

Princes and lords are but the breath of kings ,  
"An honest man's the noblest work of  
God !"

And, certes, in fair virtue's heav'nly road,  
The cottage leaves the palace far behind

What is a lordling's pomp ?—a cumbrous  
load,

Disguising oft the wretch of human kind,  
Studied in arts of hell, in wickedness refined !

O Scotia ! my dear, my native soil !  
For whom my warmest wish to Heaven  
is sent,

Long may thy hardy sons of rustic toil  
Be blest with health, and peace, and sweet  
content !



## THE SPACIOUS FIRMAMENT ON HIGH

On page 46 we give Joseph Addison's paraphrase of the Twenty third Psalm, and here we give the same author's paraphrase of the Nineteenth Psalm. In its Bible version this psalm was a great favourite of St Augustine, and Addison has skillfully retained all the teaching of the original, while expressing it in the modern poetic form.

THE spacious firmament on high,  
With all the blue ethereal sky,  
And spangled heavens—a shining frame—  
Their great Original proclaim  
The unvaried sun, from day to day,  
Doth his Creator's power display,  
And publishes to every land  
The work of an Almighty hand.

Soon as the evening shades prevail,  
The moon takes up the wondrous tale,  
And, nightly, to the listening earth,  
Repeats the story of her birth;  
Whilst all the stars that round her burn,  
And all the planets in their turn  
Confirm the tidings as they roll,  
And spread the truth from Pole to Pole.

What though in solemn silence all  
Move round this dark terrestrial ball,  
What though no real voice nor sound  
Amidst their radiant orbs be found  
In reason's ear they all rejoice,  
And utter forth a glorious voice,  
For ever singing as they shine  
The hand that made us is Divine.

## LULLABY! O LULLABY!

The writer of the following very popular baby song was William Cox Bennett, originally a watchmaker at Greenwich, where he was born in 1820. He afterwards became a journeyman and wrote many songs and sketches, dying in 1895.

LULLABY! O lullaby!  
Baby, hush that little cry!  
Light is dying,  
Bats are flying,  
Bees to-day with work have done,  
So, till comes the morrow's sun,  
Let sleep kiss those bright eyes dry!  
Lullaby! O lullaby!

Lullaby! O lullaby!  
Hush'd are all things far and nigh,  
Flowers are closing,  
Birds reposing,  
All sweet things with life are done  
Sweet, till dawns the morning sun,  
Sleep then kiss those blue eyes dry,  
Lullaby! O lullaby!

## AMBITIOUS SOPHY

We have already printed two little poems by Mrs Elizabeth Turner, whose simple verses pleased our grandmothers when they were young. The following is also from her pen.

MISS SOPHY, one fine sunny day,  
Left her work and ran away,  
When soon she reach'd the garden gate,  
Which finding lock'd, she would not wait,  
But tried to climb and scramble o'er  
A gate as high as any door.

girls should never climb,  
won't another time,  
the highest rail,  
't upon a nail,  
sad to tell,  
down she fell

## THE BABY AND THE BROOK

In this very beautiful song, sweet with the fresh charm of Nature, Longfellow, the American poet, has given an English setting to a short poem by the famous American writer named Leon Alushan, which has been popular among the countrymen of that poet for many years.

DOWN from yon distant mountain height  
The brooklet flows through the village street;  
A boy comes forth to wash his hands,  
Washing, yes, washing; there he stands,  
In the water cool and sweet.

Brook, from what mountain dost thou come?  
O my brooklet cool and sweet!  
I come from yon mountain high and cold,  
Where lieth the new snow on the old,  
And melts in the summer heat.

Brook, to what river dost thou go?  
O my brooklet, cool and sweet!  
I go to the river there below  
Where in bunches the violets grow,  
And sun and shadow meet.

Brook, to what garden dost thou go?  
O my brooklet, cool and sweet!  
I go to the garden in the vale  
Where all night long the nightingale  
Her love-song doth repeat.

Brook, to what fountain dost thou go?  
O my brooklet, cool and sweet!  
I go to the fountain at whose brink  
The maid that loves thee comes to drink,  
And whenever she looks therein,  
I rise to meet her, and kiss her chin.  
And my joy is then complete.

## THE GUEST OF SLEEP

This very beautiful poem, suggestive of happy dreams and fair visions, was written by an American lady who frequently contributes to American magazines of to-day. Her name is Theodosia Garrison, and the poem appeared in "Scribner's Magazine." The reference to the poppy is the familiar poetic way of suggesting dreamful sleep, as the liquid distilled from poppy heads induces sleep.

SLEEP at the Inn o' Dreams—  
A kindly host he waits,  
And all night long a goodly throng  
Comes softly through his gates

A varied company—  
Scholar and clown and king,  
Or prince or priest, or great or least,  
He gives them welcoming

For each he fills the cup  
Where poppy petals swim,  
Wherefrom each guest at his behest  
Drinks deeply, toasting him

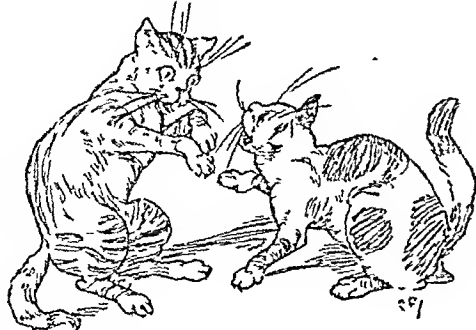
And old men drink of youth,  
And sad men of delight,  
And weary men drink deep again  
The pulsing wine of night

And poets drink of song,  
But best and, oh, most sweet!  
Above that brim where poppies swim  
The lips of lovers meet

Sleep at the Inn o' Dreams—  
A kindly host he waits,  
And all night long a goodly throng  
Comes softly through his gates

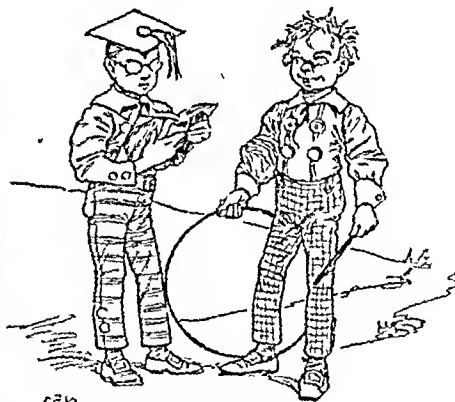


THERE were once two cats of Kilkenny,  
Each thought there was one cat  
too many,



So they fought and they fit,  
And they scratched and they bit,  
Till, excepting their nails  
And the tips of their tails,  
Instead of two cats, there weren't any.

CLAP, clap handies,  
Mammie's wee, wee ain ;  
Clap, clap handies,  
Daddie's comin' hame ,  
Hame till his bonny wee bit laddie ,  
Clap, clap handies,  
My wee, wee ain



LITTLE Bobby Snooks was fond of his  
books,  
And loved by his usher and master ,  
But naughty Jack Spry, he got a black  
eye,  
And carries his nose in a plaster.

PUSSY-CAT MEW jumped over a coal,  
, And in her best petticoat burnt a  
great hole

Poor Pussy's weeping, she'll have no  
more milk,  
Until her best petticoat's mended with  
silk !

LAVENDER blue and rosemary green,  
When I am king you shall be queen ;  
Call up my maids at four o'clock,  
Some to the wheel and some to the rock,  
Some to make hay and some to shear  
corn,  
And you and I will keep ourselves warm

A NICK and a nock,  
A hen and a cock,  
And a penny for my master.



AS I was going to sell my eggs,  
I met a man with crooked legs ,  
Crooked legs and turned-up toes,  
I tripped up his heels, and he fell on  
his nose.

ROBIN-A-BOBIN  
Bent his bow,  
Shot at a pigeon,  
And killed a crow.

JACK SPRAT had a pig, who was not  
very little, nor yet very big ,  
He was not very lean, he was not very  
fat ,  
He'll do well for a grunt, says little  
Jack Sprat







clothes, and carrying a letter to the young Princess Marie from his teacher, Margaret van Eyck, he set out with a light heart and high hope for Rotterdam. Of all the many journeyings of his life, this little journey was to prove the most eventful. On the way he fell in with an old man, accompanied by a beautiful daughter. They were evidently poor, and sat by the wayside exhausted. Gerard's kind heart was touched for them, and he shared his food with these weary wayfarers.

#### WHY THE BURGOMASTER OF TERGOU HAD AN UNEASY CONSCIENCE

It so happened that while he was sitting with them, there passed by, riding on a richly caparisoned mule, the Burgomaster, or Mayor, of Tergou. This person, Ghysbrecht van Swieten, was a notorious miser, and his withered old crab-apple face was a veritable symbol to the people of Tergou of all that was mean and niggardly. But to-day he was riding along in quite a self-satisfied manner, for he was to sup with the duke at Rotterdam.

As he came upon the little group by the wayside, however, the smile on his face changed suddenly to an expression of anger and uneasiness. He alone, with his guilty conscience, knew the reason of this. Some twenty years before, by an act of dishonesty, he had succeeded in enriching himself at the expense of this simple old man by the roadside, and when he saw Gerard, young, active, and educated, in the company of Peter Brandt and his daughter Margaret—for these were their names—his suspicious mind at once had thoughts that Gerard might have discovered his secret, and would help his victims to get back the property he had wrongfully withheld from them.

#### GERARD WINS A PRIZE AT ROTTERDAM, BUT LOSES HIS HEART

With these uneasy thoughts, the burgomaster continued on his way, while Gerard and his companions, all unconscious of Ghysbrecht's suspicions, made slower progress to Rotterdam. Here the hopes of the young man were fulfilled, as he found himself the winner of the prize for penmanship, and had a gold medal pinned on his breast and fifteen golden coins put in his purse. Not only this, but, thanks to the letter he carried, he had been warmly received

by the Countess of Charlois and her daughter, the Princess Marie, and the countess promised he should have the gift of a church the very day after he had said his first Mass, for in those days the Roman Catholic Church was supreme. The Princess Marie would have had him a bishop at once, but her mother's promise was the easier to keep.

It would have been with the lightest of hearts and the briskest of steps that Gerard made his way back to Tergou, had he not, during his visit to the palace at Rotterdam, lost trace of Peter Brandt and Margaret. So charmed had he been with the old man's beautiful daughter, that the thought of not seeing her again made him sad. He had foolishly forgotten to ask their names or where they lived.

But he had not been long returned to his home before these were disclosed to him in a curious way. The burgomaster, keen to discover what Gerard knew about his relations towards the Brandts, sent for him on pretence of requiring him to copy out the town records. But the payment he offered for the work would barely have bought pens, ink, and parchment, and Gerard protested that he required some reward for the time the writing would occupy.

#### THE WILY BURGOMASTER IS TOO CLEVER AND OUTWITS HIMSELF!

"Your time? Why, what is time to you at two-and-twenty? Say, rather, you are idle grown. You are in love. Your body is with these chanting monks, but your heart is with Peter Brandt and his red-haired girl."

"I know no Peter Brandt."

"Ye he!" shouted Ghysbrecht. "Did I not find you at her elbow on the road to Rotterdam? And were you not seen at Peter's house at Sevenberger the other day?"

Thus hoping to draw the young man to a confession, the burgomaster had only given him the information which Gerard most wished to have. Leaving Ghysbrecht's house, he set out forthwith to the neighbouring town of Sevenbergen, bent on renewing his acquaintance with Margaret and Peter.

The burgomaster had sent a servant to spy upon Gerard, and when he heard whither the young man had gone, his worst suspicions seemed to be confirmed. So now he set himself to work against him by informing Elias and Catherine



Brandts, and whose well-shot arrow had opened the gates of Gerard's prison.

As the trio were hastening away from the scene they were amazed, on looking back to see a strange figure with a head of fire ascending by the rope down which Gerard had come. For a moment Martin was filled with superstitious fears of the "haunted tower"—for it had that reputation—but another figure stood below, white and motionless. Margaret, with her woman's instinct, thought of Gerard's sister Kate, and, running to the figure, found it was she. Gerard, too, came forward, just as a strange, weird voice high up the tower was shouting "Parchment, parchment, parchment!"

High up they saw the little figure of Giles, the dwarf, a lighted lantern hung at his neck, and his hands full of parchments, which he hurled down in bundles on their heads. When he had thus thrown out the contents of the chest, he slid down the rope himself, and, in his half-witted enthusiasm at the find he had made, offered to sell this unexpected stock to Gerard, for whom he had often found parchment.

#### GERARD'S ESCAPE FROM THE TOWER AND HIS PURSUIT IN THE FOREST

"Hush! You speak too loud," said Gerard. "Gather them up and follow us to a safer place." And, giving poor Giles a few coins Gerard took the bundle, making all speed to Sevenbergen with Margaret and Martin.

There was great commotion the next day, when it was found that the burgomaster's prisoner had escaped and that the parchments had disappeared. His servant set out in pursuit, but failed to find the runaway. So, the day after, Ghysbrecht, with his constables, rode over to Sevenbergen, only to find Peter's house deserted. From an upper window, however, the burgomaster caught a glimpse of Gerard and Margaret, accompanied by Martin, making for the forest, and immediately with his men he gave pursuit.

The burgomaster, on his mule was the first to come up with them, but Gerard disabled him with a blow from his open staff, and presently the three had gained the forest, where Martin led them by puzzling paths into a thick pine-rove, where their pursuers were not likely to penetrate.

In the excitement of having beaten down his enemy, Gerard was inclined to be proud of his feat, but his gentle heart was soon chiding him, and he now found himself hoping that he had not injured the old rascal very seriously. Another moment, however, and the fugitives had to think of themselves again. A deep baying sound coming through the woods proved that they were being pursued by bloodhounds.

#### PURSUED BY BLOODHOUNDS, BUT SAVED BY MARTIN'S BOW AND ARROW

Presently one of these fierce and ravening animals burst through the trees into the open wood, where Martin had now led his companions. But the deadly arrow of the old soldier laid the bloodhound lifeless on the ground, and a second animal that followed on the heels of the first, stopping for a moment to sniff around its dead companion, also fell a victim to Martin's bow.

Saved from this terror, the three now threaded their way through the forest, only to find the burgomaster, seated on his mule and with a rough bandage across the lower part of his face, which had suffered severely from Gerard's attack. He was keeping watch on the likest place for them to leave the forest, but in a few moments Gerard disposed of him, by knocking him off the mule, upon which Martin mounted with the half-fainting Margaret. With the active Gerard running beside, they soon outdistanced their pursuers and reached the German frontier. Here Gerard took a heartbroken farewell of his wife, and leaving her in charge of the good archer, who promised to see her safely back to Sevenbergen, he struck over the border and began his long and eventful journey to Rome.

#### WHAT HAPPENED AFTER GERARD'S FLIGHT FROM HOLLAND

He had no lack of adventures by the way, found strange companions, suffered many trials, worst of all, his parting from a bluff, hearty soldier named Denys, with whom he had become very friendly. But we will leave him on his way into Italy and follow the fortunes of Margaret meanwhile.

Martin Wittenhaagen had safely escorted her back to Sevenbergen, and then going straight to Rotterdam, laid the whole affair before the duke, returning home with a free pardon for



found himself deciphering the contents of the parchment he had carried away with him from Tergou. To his amazement, he realised that it dealt with a loan of money granted by Ghysbrecht to Margaret's grandfather against the rents of certain land, but which loan must have been repaid many times over. The old miser had illegally kept the property, thus impoverishing Peter Brandt and Margaret.

#### HANS MEMLING'S VISIT TO ROME AND THE FATEFUL LETTER

"Fool," he cried aloud, "not to have read this before!" Fool, indeed, and tardily awake to his foolishness. But now he was all activity, and, taking horse, he rode to the nearest port whence he could engage a passage to Amsterdam, meaning to clear up his affairs in Rome and to return to Holland at once.

On coming back from his errand, however, his landlady gave him a packet of silver crowns, together with a letter which Hans Memling, who had called in his absence, had left for him. Seizing the letter, he began eagerly to read it aloud, his voice changing presently to tones of terror, for it was the false story of the death of Margaret.

"It is a lie!" he cried, when he had read the bitter epistle to the end. "Where is this Hans? I will cram his murdering falsehood down his throat!" So saying, he fled from the house, and in the agony of his mind went furiously and aimlessly about the streets for hours before returning to his lodging.

#### GERARD'S DESPAIR AND HIS NARROW ESCAPE FROM DEATH

There he fell into a fever, which continued many days. And when he came to consciousness again, it was to find Brother Colonna, accompanied by Brother Jerome, the Dominican friar whom Gerard had helped at the time of the shipwreck, seated by his bed. They tried to console him, and spoke of the consolations which the Church had to offer to the wounded spirit and the bruised heart, but Gerard, in the deep dejection which had now come upon him, no longer doubting that the news was true, was in revolt against all suggestions of religion, and blindly furious at his unhappy fate.

When his strength had returned and he was about again, instead of turning his thoughts to the Church, he sought to

forget his unhappiness by sharing in the gay life of Rome, which was then at its gayest under the Papal rule.

His companions now were fellows of bad repute, and once, when with a reckless company boating on the Tiber, he passed the Princess Clahia. She, recognising him, was mortified to think that he should prefer such company to her own, and, her jealousy aroused once more, hired an assassin to kill him. This assassin was none other than Teresa's husband, and when he found whom he had to kill he could not do the deed. Instead of killing Gerard he saved that unhappy man from drowning in the Tiber, and on his way to his own house, carrying the dripping form of Gerard, he was hailed by Friar Jerome as he passed the monastery gates. That bulky monk, recognising Gerard's face, bade Ludovico carry him into the building. Thus, when Gerard awakened to consciousness again, the Dominican monk was by his side.

#### THE TRAGEDY OF THE LETTER MAKES A PRIEST OF GERARD AFTER ALL

And now he was no longer angry at the consolations of the Church, nor adverse to the thoughts of a monkish life. Indeed, he was soon persuaded that peace of mind and rest for his troubled spirit were to be found only in the fraternity of St Dominic, and so, in due course, Gerard took the vows, and became a friar under the name of Brother Clement.

Our story now shifts back once more to those whom Gerard had left behind in Holland. There in Rotterdam there was another Gerard now, a little boy born to Margaret, named after the father who had never seen him. Denys, the jolly soldier, had gone away to Burgundy, and Margaret, working as a laundress, was struggling to support her aged father. Poor though they were, she might have been happy if she had but news of Gerard.

The birth of little Gerard had a curious effect in making Ghysbrecht, the burgomaster, strangely uneasy about the wrong he had done to Peter Brandt and his daughter. Parched and dry though his soul must have been, his conscience pricked him when he realised that he stood the robber of three generations, and that he had written the lying letter which was keeping



cowering and shuddering, almost hid themselves beneath the table, while Gerard tore a letter from his bosom and flung it down before his father.

"Read that," he said sternly, "thou hard old man, that didst imprison thy son. Read and see what monsters thou hast brought into the world. The memory of my wrongs and hers will dwell with you all for ever. I will meet you again on the Judgment Day. On earth you will never see me more."

#### GERARD LEARNS THE TRUTH & MARGARET GETS HER FORTUNE TOO LATE

And in a moment, as he had come so he was gone, leaving them stiff and cold and white as statues.

Rushing from the house, white and raging, Gerard passed Margaret on her way thither, but stayed not his frenzied haste, while within the house old Elias in his wrath would have killed his two evil sons had they not escaped.

The rest of the story is soon told, for all its tragedy is now before us and nothing remains but resignation and devotion to a new ideal for its chief actors.

The burgomaster lay dying when Gerard went to see him at Teigou, intent on making him restore to Margaret her fortune, which he did, with added interest, for all the years he had wrongfully retained it. But when Margaret looked on her wealth with wondering eyes, her only words were "Too late! Too late!" Nor did the inheritance of the property of Margaret van Eyck, who died soon after, help to dispel the cloud that had now settled upon her life for ever, for Gerard had disappeared again, as soon as he knew that Margaret was relieved of all worldly need and she thought him hard of heart to show no wish to meet her or their child, forgetting, perhaps, the impassable barrier now between them.

#### HOW THE PRINCESS MARIE KEPT HER WORD TO GERARD

But when the Princess Marie heard that Gerard was now a priest, she fulfilled the old promise, and appointed him Vicar of Gouda. Meanwhile, however, the monk had been living as a hermit in a cave at Gouda, and took much persuading before he could be got to go and live in Gouda Manse, where, no longer Brother Clement, friar and hermit, he stood forth as Gerard Eliassen, Vicar of Gouda.

Many serene and peaceful years were now to be lived by Gerard and Margaret, who though restored to each other, could never be united. He attended to his priestly duties, and she to the rearing of their son and the help of the poor.

As little Gerard grew up he was sent to one of the most famous schools, and great things were expected of him, so bright was his intelligence. But the plague broke out in the town where his school was, and Gerard hastened over to bring the boy away, only to find that Margaret had been there before him, and had sent her son safely off to Rotterdam, but she herself fell ill.

Gerard was thus little more than in time to be with her, and comfort her in her last moments. He read the service at her grave with scarcely a tremor in his voice. But at the sound of the earth falling upon the coffin he uttered a piercing shriek, saying to a friend who stood beside him "Ah, Jorian, something snapped within me! I felt it, and I heard it. Here!" And he put his hand to his breast.

#### HOW GERARD'S LIFE WAS ENDED IN THE CLOISTER AT GOUDA

It was no more than a fortnight later that Gerard himself, broken in body as well as in heart, sought refuge in the Dominican convent near Gouda, and wished to be accepted there as a new brother who had come but to die.

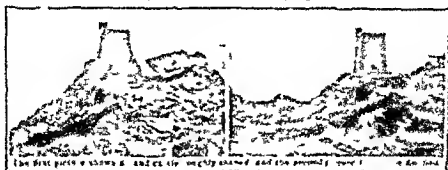
The temporary prior of the convent was one named Brother Ambrose, who, on seeing Gerard, exclaimed, "Clement!" and Gerard said, "Jerome!" for it was his companion of many years ago.

When Gerard died, a few days later, under his linen was found a horse-hair shirt, and under that a long tress of auburn hair; and when the coffin was to be closed, Jerome cleared the cell, and put the tress of hair upon the dead man's bosom.

Elias and Catherine lived to a great age, so long, indeed, that both Gerard and Margaret grew to be dim memories to them, while the yellow-haired laddie Gerard Gerardson belongs not to fiction, but to history as he lived to be the first scholar and divine of his epoch, and was also the heaven-born dramatist of his century, for under the name of Erasmus he became, and is remembered for all time, as one of the world's great men.

The next Famous Books are on page 4063

THINGS TO MAKE  
THINGS TO DO



BUILDING SAND CASTLES



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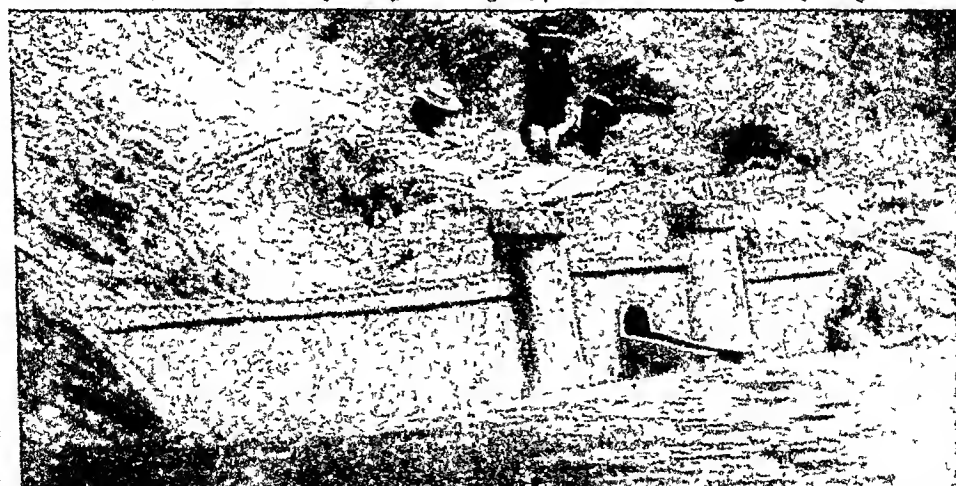
# BUILDING A SAND CASTLE ON THE BEACH



A bucket and spade, a supply of moist sand, and willing hands with plenty of patience are all that is necessary for the making of a fine castle by the sea. Here we see the builders beginning the walls and towers



The arch for the gateway is one of the most difficult parts of the building. The sand must be made very wet, so that it will "bind," and not fall down upon the garrison or guests, whom we have to imagine as passing in and out



Patience and skill have at last won a triumph for the bucket and spade, and here we have the noble ramparts of a castle. Any number of fairy soldiers might keep guard behind those sturdy walls, and the little crosses are each the hiding-place of a bowman ready to let fly his arrow at any enemy who may appear. These three photographs of sand castles and those on page 4025 are by Mr. W. P. Adams



# A USEFUL LITTLE CROCHET PURSE

A **SAFETY** purse must be used in order to appreciate its usefulness. It is called "safety" because when once the money is dropped in between the chains at the opening, it cannot possibly fall out, it is generally worn round the neck on a crocheted chain, and tucked into a fold in the blouse or the waistband.

We can, of course, make the purse any size we like. That shown in the picture is a large one, about five inches by three and a half inches. It is made of shaded yellow mercinette at 2½d a ball, and crocheted with a long strip, about one-third of which forms a flap to cover the opening.

We start by making fifty-six chain stitches — if we have not done any crochet work before, we should turn to page 1348 — then make three extra chain stitches for the turning, and put one treble stitch into the fourth chain back.

Next we crochet one chain, then put one treble stitch into the next chain below, repeat that into the next chain, again crochet chain, miss a stitch below, and thus repeat one chain two treble to the end of the original chain.

Before turning to work back again, we crochet three chain to form a turning, reverse ends and put two treble into the first large hole below, then crochet one chain over a missed stitch below, and repeat this to the end of the row.

We make thirty-five rows like this, and, without breaking off the thread, start making chains along the edge of one end. These chains are for the purpose of closing the purse.

If we make fifteen long chains into loops along one end, and draw the loops through the row of holes lying nearest when the strip is folded up, the ends of the loops can be crocheted into a ring at the back of the purse. Another crochet chain is then put through the ring, and passed over the head so that it can hang round the neck.

Now to return to our chains. It will help us to strengthen the edge of the opening, if, while making these chains, we crochet along the two chain between the large holes, then draw down the thread through the large hole, and at once start making a fifty-six chain. This chain is very simply made — by taking a single stitch through the

same large hole, followed by two single stitches into the two chain along the edge.

Having thus made and attached the looped chain, and without breaking off the thread, we fold up the end of the strip with the chains attached and drag these through a row of holes with the crochet hook, the part above the holes serving as a flap to the purse.

Evidently the next thing to be done is to crochet together the doubled-up edge of the strip on the side where the thread now is. That we do by pressing the two edges together between the left thumb and first finger, so that two stitches are side by side, and then crochet single through the two.

At the end we have to break off our thread by making one extra chain stitch, drawing the thread through, cutting it, and pulling it taut. The loose end is drawn through two or three stitches to hide it. We

next join the edges of the opposite side, and continue crocheting round the flap to give it a firm edging.

Lastly, we crochet a little chain of a suitable length for a ring, join it up, and double crochet into it all round, drawing into each stitch the looped chains until the fifteen are exhausted.

The purse itself is now finished, and all we have to do is to suspend it round the neck by a long crocheted chain.

As this purse is a large one, and quite a small purse may be preferred, a useful small bag is made on a chain of thirty

stitches with three added for turning, and twenty-seven rows for the strip. Nine looped chains will be sufficient, and the worker will find that after a time it is unnecessary to count the stitches in these, the chains can be measured to the length of the first one made.

It does not particularly matter how long they are, but they must be equal, and allow the purse to open wide enough to drop in and take out coins between them. To close the purse after opening it, simply give a tug to the bottom of it.

Peri-lusta or eye-bright can be used instead of mercinette. A ball will make two purses, and it is surprising how quickly two little ones can be made. They are sure to please girl friends.

Many people find these purses very useful for carrying gold or silver when travelling.



THE CROCHET PURSE COMPLETED



## GAMES PLAYED

UNLIKE chess and draughts, which are very ancient games, dominos are not known to have been played before the eighteenth century, when it was introduced into France and Belgium from Italy, and later came into England. Dominos are very popular here, but in no other country are they played so much to-day as in France and Belgium.

A set of dominos usually consists of twenty-eight pieces, each divided into two parts with so many spots or pips on each, although in the north of England sets are often used that contain fifty-five dominos, going up to the double nine, and on the Continent it is quite common to go up to the double twelve.

### THE BLOCK GAME

THE simplest game with dominos is known as the block game. The dominos are placed on the table with their faces downwards and shuffled. Then each player draws one, and when these are turned up the player with the fewest spots or pips is the one to start the game. The dominos are now shuffled again and each player takes seven pieces, which he looks at, but conceals from the other players.

The first player now puts a domino down, say, the six-five, and the next player has to play a piece with a six or a five on it. This he places against the corresponding number and the next player's turn comes. If the second player puts down a six-three, then the third player would play to a five or a three. Thus the play goes on until a player has used all his pieces, when he wins the game. If there comes a deadlock, and no player can match the numbers that are up, then all the outstanding pieces of the players must be turned up, and he wins who has the fewest pips.

### THE DRAWING GAME

THIS game is played in exactly the same way as the block game, except that when a player cannot go, instead of passing he must draw from the unused stock of dominos until he is able to play. Two dominos, however, must always be left face downwards on the table and not drawn. In both the games described it is always best to play the high pieces, such as double six, six-five, double five, and so on, first, so that if in the end no one can go, we may have as few pips left as possible.

### FIVES AND THREES

ANOTHER interesting and exciting game with dominos is called Fives and Threes. The pieces are shuffled and drawn as before, but the game is not to get out first, but to make as many fives and threes as possible. For instance, the first player puts down the five-four. This makes nine, or three threes. He scores three points. The next player must play to five or four, but he must try to make the outside numbers add up to multiply by three or five. He plays, say, a four-one to the four, and the outside added to five makes six, or two threes. He scores two. The next player plays to five or one. He puts down the five-one not to the five end, but to the

## WITH DOMINOES

one, and the outside five added makes ten, or two fives; score two. Now, suppose the next player has the double five, he puts it down crosswise, and both sections of the domino count—that is, ten is added to five at the other end, making fifteen. But fifteen is not only five threes, it is also three fives, and so fifteen up scores eight points. Only one other combination will give fifteen, and that is three at one end and double six at the other. Double dominos are always placed crosswise on the line and the pips on both sections are counted. This is one of the best possible games with dominos. It is always dangerous to start the game with double six, in case the next player may have the six-three and score eight points.

Two, three, or four players can play at this game, and the number of points to be played up—usually 31 or 61—is always decided beforehand by the players.

### THE GAME OF MATADOR

IN this game, instead of matching a number, we have to place down a domino so as to make up the number seven. Thus, if the first player has played the five-two, we must play a piece with a two or a five on it, so as to make a seven with one end of the first domino. Suppose the second player puts down a two-six, the end numbers are now six and two, and the next player must put down either a one or a five to make up seven. When a domino is played that makes a blank at the end, this blocks that end, and only a matador domino can be played there.

There are four matador dominos, the double blank, and the three pieces that have seven pips upon them, namely, the six-one, the five-two, and the four-three. A matador may be played to any number, even if one of its squares does not make up seven with the last piece played, but the piece played to a matador must make seven in the ordinary way.

As a matador may be played to any number, it is wise to keep our matadors in reserve for a difficulty. In playing this game each player takes seven pieces, but when we cannot go we must draw from the reserve, as in the drawing game.

All these games of dominos may be played by two, three, or four people, and four may play either as individuals or as partners.

### OTHER GAMES

THERE are, of course, variations of these games which are sometimes played. For instance, matador can be played by using five or some other number as matador. If five were taken as matador, then the matador pieces would be five-blank, four-one, three-two, and the double blank; if six were matador, then six-blank, five one, four-two, and three-three, and double blank would be matador pieces—that is, there would be five instead of four such pieces. Similarly, the game of fives and threes can be adapted to twos and fives or fours and fives, but experience has proved fives and threes to be the best and most interesting combination.





# THINGS TO DO IN AWKWARD SITUATIONS

## WITH HINTS FOR BOY SCOUTS

It is essential for any boy who wishes to become successful in life that he should be full of resource, and able to adapt himself to every circumstance in which he is likely to be found. Such resourcefulness is needed not only in boy scouts, but in every boy who does not belong to any organised body of scouts. There are many things that a boy may do when out for a day in the country that will fit him for real scouting and camping work, should the need for such work arise.

### TO CARRY WATER

There are various ways of conveying water from one place to another when we have no pails or proper vessels for the purpose. Canvas bags, smeared with grease on the outside, are quite waterproof after they have been soaked for a short time. A basket with oiled cloth arranged inside makes a useful bucket, and if an old coconut shell is handy, it may be used for holding water. It is worth remembering that if we are carrying water in water prevents it splashing. A hole in a leaky vessel may be stopped temporarily with rag or grass well greased over.

### TO LIGHT A FIRE

In these days of cheap lucifer matches, there is rarely any need for us to "make fire" when we want to light a fire of wood. But even with matches it sometimes happens that a whole boxful may be wasted on a windy day before the fire can be lighted. It is useful, therefore, to put a greatcoat or cloak over our head and over the piled-up wood before we strike the matches, and then, if we have taken the precaution to gather plenty of dried grass and small twigs, we shall have no difficulty in lighting our fire. Wax matches are much better for outdoor use than wooden ones, as the latter get damp in wet weather if they are exposed to the air for long. If we have nothing dry to rub the match upon, we may ignite it by scratching the head of it with the blade of our penknife.

### FUEL FOR FIRE

It may not always be easy to get wood for fuel, and it is worth knowing that there are various other substances that travellers use for this purpose. Bones of animals are very useful for this purpose, particularly if fresh, as even the bones of cooked meat, if added to a fire, will burn well. The dry manure of cattle, as found upon the ground, is also very useful, and is not at all disagreeable as fuel. Nothing better offers, dried seaweed will burn with great heat, although it does not make a fine, cheerful fire. If large logs are being used for fire, two or three of them

should be arranged as shown in the picture, the dark ends being the part in the fire. As they burn away they are pushed forward, and so are burnt according to a regular system.

### TO REST IN A GALE

To lie down and rest in the open air when a gale of wind is blowing, we must not make the mistake of getting under a tree, which provides a good roof high up, but has no wall. What we need is a wall, and a wall about eighteen inches in height will be quite high enough.

This may be provided by turning up the turf if we have a spade, or by piling up stones, or perhaps we may find a little hollow with a natural sheltering wall. In a heavy gale there is always a violent eddy in the neighbourhood of a tree, and the result may be seen in a cornfield after a storm, where the corn in the open is unharmed but that near the tree is all beaten down. It is always warmer to lie down under a cloudy sky than under a clear sky, for the clouds act as a blanket. On sandy plains travellers often keep themselves

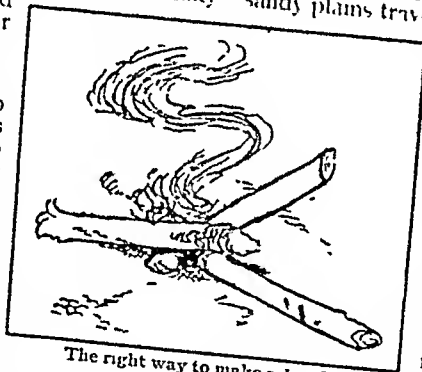
warm when sleeping at night by burying all but their heads in the sand. The same plan is followed in snowy lands, the snow making a really warm covering and protection from the cold air.

### A SIMPLE MATTRESS

When resting or sleeping in the open air, it is as necessary to have something to lie upon as to have proper covering for the body, otherwise the part of the body that is in contact with the earth may get chilled. All kinds of things will provide a useful mattress, and in this matter we may imitate the bird in making its nest. Dried grass, leaves, feathers, heather, wood shavings, bundles of faggots, newspapers, and such like, can be used with advantage, and if the ground is really wet, an excellent bedstead can be made from a heap of stones or a couple of tree-trunks rolled together, if such are available.

### SEATS FOR A MEAL

If we are going to make a stay in one place for any length of time and have no furniture, it is a good plan to dig a trench. This provides both chairs and table, for we can sit on one side of the trench with the feet and legs in the hole, and the other side of the trench makes a handy table. In this way we have a much more comfortable seat than we otherwise should have if we just sat about on the ground or on any odd log that happened to be about. If we are not staying long enough in any place for it to be advisable to dig a trench, we can gather up any dry litter that may be lying about and sit on that.



The right way to make a log fire



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The boys are divided into two parties, one of six and the other of five, and each party is stationed at the side of the field or stage, like the girls. When the four groups have taken up positions, the boys must march on in correct time, so that the leader of the party of six arrives at the space between the two groups farthest away from the audience just a fraction before the leader of the party of five.

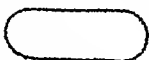
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Meanwhile, the first boy who marches to the right passes between the two groups on the right and down the central gangway, where he takes up his place in the back row, the first boy round from the left comes next, and so on until the cross is complete. Then, at a given signal, each row joins hands, and the flag of St. George is finished.

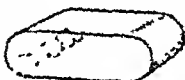
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This is an amusing little toy that is easily made. We cut two pieces of thick cardboard, one an inch and a half or two inches long and half an inch wide. Both of these we cut at each end to the shape of a semi-circle. Now we get a strip of paper—writing-paper will do—one inch wide, and we gum it or glue it round the edges of the two pieces cardboard, in the position shown in picture 1. That gives us a tiny oblong box, as seen in the picture. For the top of the box we place a piece of paper as already mentioned, we place inside the box a few round lead bullets or laterals, but not more than will fill up the box in one row. Our "tumbling tablet" is ready to perform. All we have to do now is to place it on any surface with a gentle slope and give it a



1 Shape of side



2 Complete tablet

little start. A tray tilted just a little, or a large book lifted a little higher at one end than the other, will do. Of course, we place the tumbling tablet up at the highest part of the sloping surface. Perhaps it will need a start to go off, and if so we need only roll it over once. Then it will roll over and over down the slope, almost as if it were alive. If we are really clever, we can easily understand why it behaves so. The balls or shot roll down the inside of the tablet until they reach the lower end, against which they bump, thereby causing the tablet to turn over. This movement sends the balls at what has become the higher end of the tiny box, and again they roll down to repeat the operation time after time, until they come to a stop because the bottom of the slope is reached.



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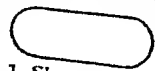
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2 Complete tablet



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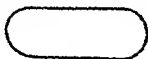
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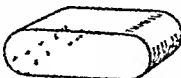
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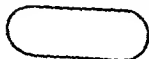
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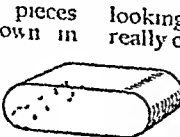
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THE NEXT THINGS TO MAKE AND THINGS TO DO BEGIN ON PAGE 4137



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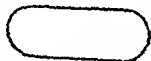
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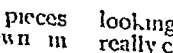
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